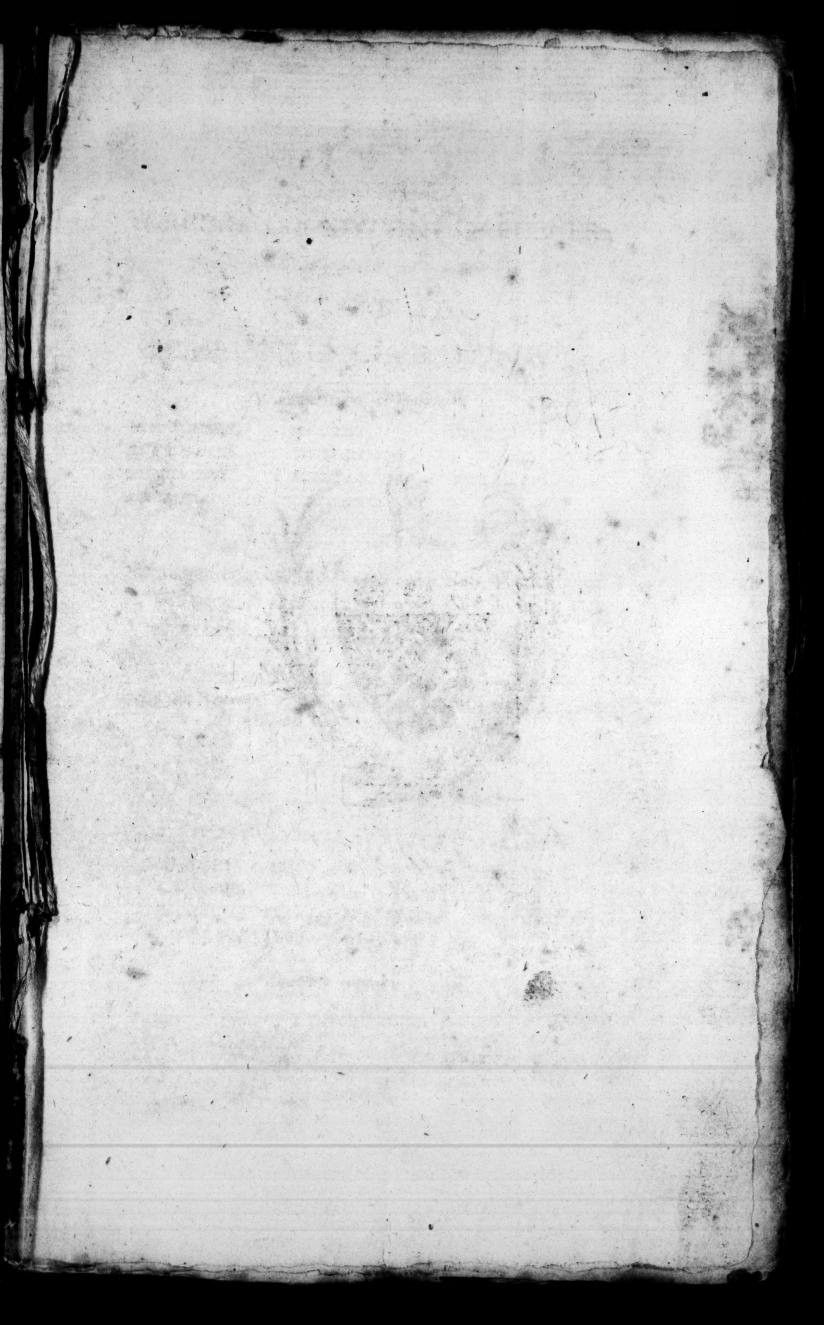
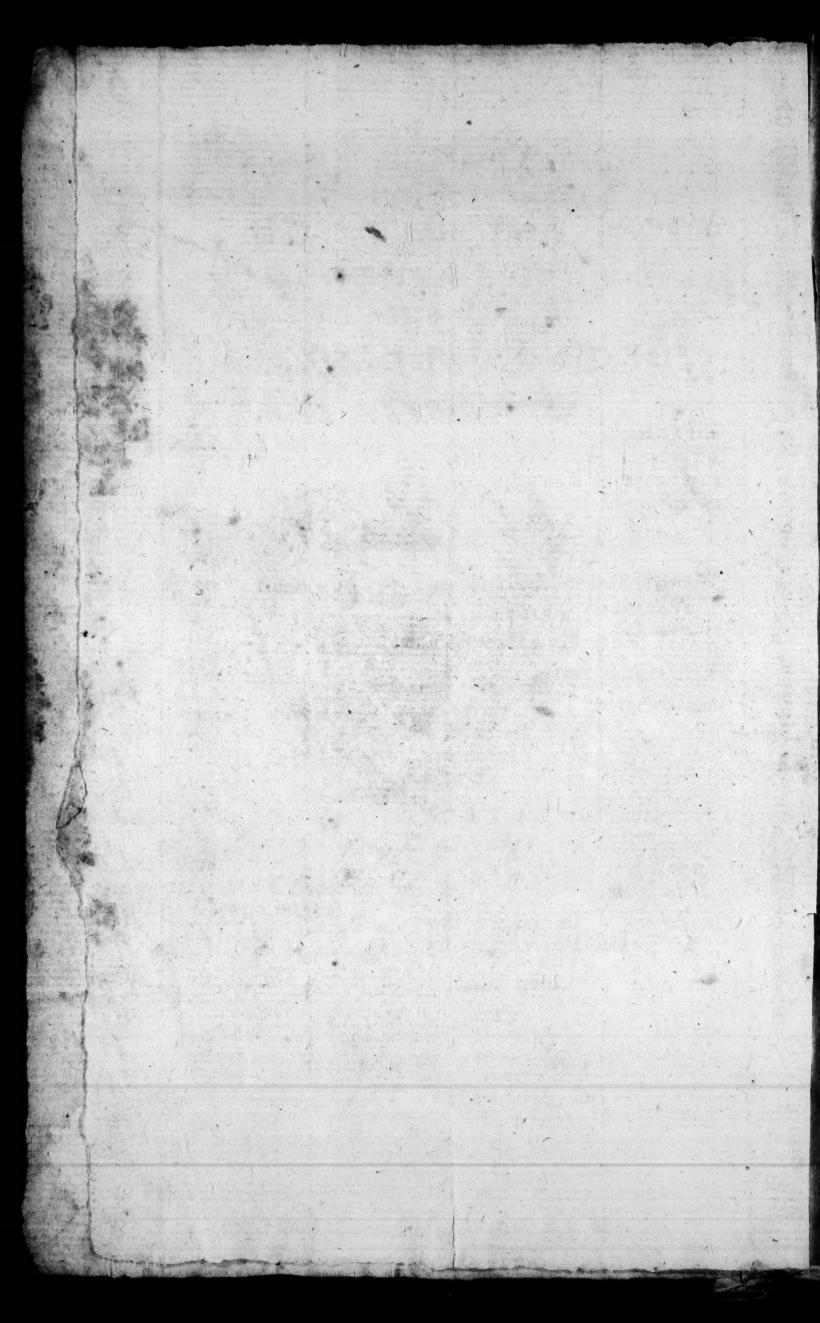
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Chris, Jeaffreson, Esq. Dullingham?





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THE

SCOTCH

FORCING AND KITCHEN GARDENER;

Being a Second Edition with Extensive Additions, of the

SCOTCH FORCING GARDENER:

Comprending the Forcing of

ASPARAGUS,

MELONS,

PINE APPLES,

CUCUMBERS,

MUSHROOMS.

AND

CHERRIES,

NECTARINES,

STRAWBERRIES.

GRAPES, PEACHES,

TOGETHER WITH THE

Management of the GREEN-HOUSE—Culture of WALL and ORCHARD FRUITS—KITCHEN VEGETABLES, SALLADS and HERBS.

Illustrated with FIVE COPPERPLATES;
Containing Ten different Designs of Hot-Houses, Hot-Walls, &c. on the newest and most improved Constructions.

BY WALTER NICOL, LATE GARDENER AT WEMYSS CASTLE;

Author of an "Essay on Gardening," drawn up by Defire, and for Confideration of the Board of Agriculture; and Corresponding Member of the Natural History Society of Edinburgh.

EDINBURGH:

PRINTED FOR THE AUTHOR.

1798.



Entered in Stationers Pall,

ADDRESS,

TO THE

PUBLIC.

IF we may judge of the manner in which a Book is received, by quickness of sale and increasing demand, I should suppose the first edition of this hath met with a favourable reception. Having, within the short space of four months, disposed of a large impression.

Whether this be a proof of the value of a Book also, may be questioned; since novelty goes a great length in all things. But, if the judgment of professional men may be considered as the criterion; then, with humility, I must crave some merit for my first edition.— Nine tenths of it is in their hands.

I have

I have only to express my high sense of gratitude for the liberal reception of the last, and to hope that the subject of this edition, will also be favourably received by a generous Public.

THE AUTHOR.

EDINT. 10th March,

SCOTCH FORCING GARDENER.

INTRODUCTION.

THIS branch of Gardening certainly favours more of luxury than any other, at fame time it must be allowed to be a most rational amusement, profit and pleasure being in some measure blended together.

Hereby are not only the most rare European plants, but also those of Africa, Asia, and America, cultivated and brought to very considerable perfection, and to the intimate acquaintance of the Botanist, who, otherwise, would be obliged to place implicit considence in the authors of distant countries, or take expensive voyages to enable him fully to pursue his studies.

Hereby, also, are the finest fruits of France, Spain, Italy, Persia, and the West Indies, cultivated and brought brought to early perfection in our Northern Clime, which, otherwise, would be known by name only.

What are reckoned luxuries when first introduced, are by use converted into necessaries. Witness coffea, tea, sugar, &c. which, although lately introduced, were they prohibited, would not only be missed, but even longed for by the lowest classes of the community.

May not the wealthy eat a melon, peach, bunch of grapes, or pine apple, with as much propriety as drink a bottle of port, claret, champaign, or madeira? Are they not, if well ripened, equally whole-fome? Have they not the most rational amusement in the production of them? And does it not, to the contemplative mind, afford a source of real pleasure? We are certainly justified in thinking so, by recollection of the many extensive additions and improvements which have lately taken place in this elegant branch of horticulture.

Nevertheless, there is still ample room for improvement, which in a science so complicated, must necessarily happen for a considerable length of time after introduction. It is even probable, that this branch, in respect of improvement, is but in a state of infancy. And this supposition arises by considering the many opinions and ideas entertained by professional men on this subject; for until those of any science,

science are agreed, respecting points of the first consequence, perfection cannot be supposed near.

A fettled plan of constructing hot-houses, &c. is by no means yet fixed, most gardeners and hot-house builders differing in some point or other. This is an article of importance, and there are extremes which should be avoided. But it would appear, the failure of success in this species of horticulture is less in consequence of improper construction of the house, than in the preparation of proper soil, and the general management; since in some instances we find excellent crops produced in houses very indifferently constructed; and in others, very indifferent crops, in houses well constructed.

Situation is also a material point. Every hothouse should be placed, if not in a sheltered, at least in a dry one, or which is capable of being rendered so.

It is also of importance to have a perfect command of fire-heat. For this purpose respect must be had to proportioning the content of the house, to the power of the furnace or furnaces, and that too, according to the purpose for which it is appropriated, as, whether it be a Pinery, Vinery, or Peach-house, and if either of the latter, whether it be intended for early or late forcing.

But there are those who lay more than sufficient

stress on this subject. Thinking, perhaps, to demonstrate, that by building a capacious house, with a furnace less than another would advise, or which in the end is found necessary, how great a saving there might be of suel.

Of this, however, experience has convinced me, that by allotting space which a furnace cannot well command, instead of being a saving, is a great waste of suel. Nor shall the gardener ever have success, but with much difficulty.

For instance, if a furnace shall be placed at one end of a capacious house, which with difficulty can be raised to the degree required on a scale hung in the middle, will not the end of the house whereat the furnace is placed, be over-heated? and, will the other end ever rise to the degree required, before all other parts of the house be over-heated? Is not this both a waste of suel, and thwarting of intention?

And what faving is there in the first outset? or rather, what waste is there by rending the surnace and slue with immoderate heat? Is there an inch of slue less?—There is, to be sure, a grate and surnace more, which may cost some forty or sisty shillings; but which will, in one season, be repaid by the saving in such a surnace require any repair for many years afterwards.

But, laying all confideration of expence aside, if it

is found that a hot-house shall be more steadily wrought with two surnaces than with one, Why not erect two? Does the trisling sum of a few shillings in any measure weigh with the insurance of success, in the production of good crops?

I do not here presume, that for every hot-house there are to be two surnaces erected. I would be understood as speaking of large houses, that is, grape and pine houses above forty feet in length, and peach houses above sifty, &c. But for a full explanation of my ideas on this subject, I beg to refer the reader to the accompanying plates and their explanations.

Forcing, that is, producing flowers and fruits in hot-houses at an untimely season, is attended with more or less success, according to the nearness we approach nature in the process.

Hence the necessity of introducing the imposed climate, as it were by stealth, admitting air freely, unless of an impure nature, and making artificial dews and showers to nourish and refresh, not only the root, but also the foliage.

Also, as the plants are forced out of their natural inclinations in great measure, do not perspire so copiously, nor have an opportunity of imbibing nutritive matter from the natural atmosphere in such quantity as if growing in the open air, of composing a

richer

In the cultivation of exotic plants and fruits in hothouses, regard must be had to the climate of their nativity; and the best endeavours be used to imitate it in the hot-house; introducing the natural changes of the seasons with equal care.

This, however, is done with confiderable difficulty, as may be conceived by confidering the difference of latitude, and the variation of the fun's altitude throughout the season, which is greater as we approach the pole.

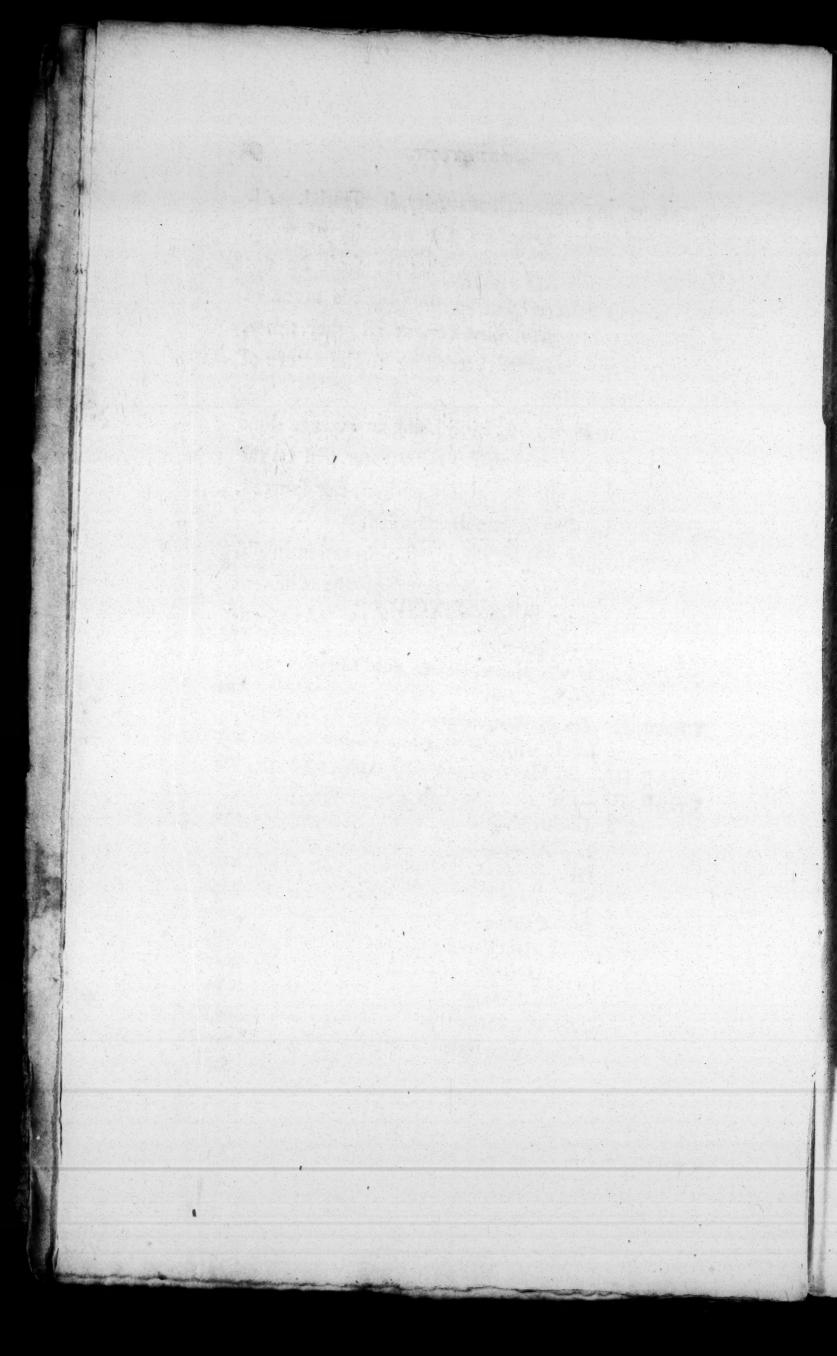
Hence the difference of trouble attending early and late forcing. And hence, also, the difference of injury done the plants in the operation; and, that they may sustain the less, the necessity of a more moderate treatment in the one than the other. The one is striving, the other striving hard against the stream.

Sudden checks of anykind are to be avoided, particularly while the bloom or truit is in a tender and infant state, otherwise disappointments may be apprehended. This is to be more particularly attended to in the forcing of stone, than other fruits; being more impatient of sudden changes in the climate, particularly while setting and stoning.

For the production of fruits in a high state of slavour and perfection, a large and free circulation of fresh fresh air, as they approach maturity, is essential. Also denying in great measure, the quantity of water
the plants may seem to crave, that the fruit be not
rendered insipid by the plants imbibing too much of
of that element; which, however, at all other times,
should be freely bestowed according to the nature of
the plant in question.

Finally, forcing of any kind being an outrage done nature, the more we avoid it the greater will be the fuccess. She should be kindly assisted, nor spurred, nor thwarted, when it can be avoided.

Hence the necessity of the nicest observation in discovering the natural inclinations of the different plants, and which should be kindly treated and encouraged, on all occasions.



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19. for kinds read kind. 165. 7. for fruit read shoots.

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THE SCOTCH

FORCING GARDENER:

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ASPARAGUS.

feet long, and for wid HIS delicious and wholesome vegetable being required in most families at an early season, the forcing of it is pretty generally understood; yet, for the sake of those who may not have had an opportunity of feeing the common methods practifed, and on account of some successful experiments I have made in this branch of forcing, I hope what I have to advance on this subject will both be acceptable and useful to my readers.

WHERE there is not the conveniency of a forcing pit, (See Plate I. Fig. 1.) a frame and lights, fuch as is used for melons, must be employed: but I have found by experience that a flued pit is much to be preferred; as in it you can produce your grass of a much better colour, and higher flavour, than on a dung hot-bed.

It

It also frequently occurs, in large families, and where much company is kept, that the gardener is put to a nonplus, by not being timeously advised that such articles are wanted. The conveniency of a pit will be found to be a great relief in this respect; as it is much easier (by aid of the slues) to forward or protract the growth of the plants here, than in a common hot-bed: on the one hand, if the plants are advancing too rapidly, you are under the necessity of cooling the bed in a certain degree; and, on the other, if they are not advancing so fast as you could wish, you are under the necessity of applying linings, which is attended with much trouble and loss of time.

A pit twenty-five or thirty feet long, and fix wide, and which one fire can perfectly command, is sufficient to force Asparagus to serve a large family from November to May in a constant and regular succession: after which, it may be advantageously employed in raising a late crop of melons or cucumbers, or in striking young pine-apple plants, &c.—But, as there may be many who may not have the conveniency of a pit, I shall first treat of the method of forcing Asparagus on a dung hot-bed, and then in slued pits, according to my mode of practice.

First, then, let it be presumed that you have a good stock of roots, not younger than four years, nor older than seven or eight, which, by being covered with litter, &c. you can have access to, in case of frost, at any time; and also, that you are required to have Asparagus on the table against a certain day,

fuppose

Suppose the first of December *. About the first of November, let a sufficient quantity of stable dung be shaken up, to heat and sweeten, for a three light box; and after it has lain for fix or eight days, let it be turned over, and shaken well up a second time; in which state let it lie four or five days more: by which time it will be ready for building the bed. This must be done, in the common way, to the height of four feet in the back, and three in front, and about a foot larger than the frame all round. Level it well; and cover the whole with squares of turf, cut so as to join again exactly; which lay green fide down, and fmooth well with the back of the spade. Place the frame thereon; which should be thirty inches deep in the back, and twenty in front: in which lay dry, wellreduced old tan, to the thickness of fix or eight inches; which also level, and gently smooth with the spade.

A 2 Your

* It may be new to some, that, by cutting over all the stalks of asparagus about the end of May, or beginning of June, it will put forth fine grass in Autumn; which, if the season happens to be fine, will continue till the middle or latter end of November. This is the reason I have fixed on the first of December for forced asparagus being required, as above: but I do not mean that this is to be considered as a rule. Sometimes it may be required much sooner, and sometimes not till Christmas.—I beg leave to observe here, that, where there is a great stock of asparagus, it is a good way to cut over a part in May or June, to come in in Autumn: but let not the gardener expect any more good from the grass so cut, as some pretend;—it is a species of forcing, and consequently must exhaust nature.

Your roots being ready, (which should be taken up with great care,) proceed to lay them (crowns up) as close as they will lie together; endeavouring to keep them as level as possible, and divesting them of all the old hulm and rotten roots. Cover the whole with the same old tan, to the thickness of three inches; and put on the lights.

The bed will begin to heat in twenty-four hours; and must then have air admitted to pass off any steam that may arise, which will, however, be inconsiderable, I prefume. Indeed, the only cause of turfing the surface is to prevent the steam; which, if carefully done, will have the defired effect; yet, it fometimes happens that there will be a little, especially if the dung did not undergo a proper fermentation: but, until the grass begin to appear, it is not of great consequence if there is a little steam in the frame; nor, providing there is not much steam, whether it has any air admitted or not. But, from the moment the buds begin to peep through, the greatest attention must be paid to prevent steam; which is fure to give the grafs a very difagreeable flavour and bad colour. In order to prevent the grafs drawing up weak, a large portion of air must be admitted every day, if the weather be not stormy; and a little air should also be left at night, while the bed has a rank heat in it. Farenheit's thermometer should not stand above 50° at any time, unless in fun-shine, and then not above 60°. By the above rule, it will eafily be feen whether matting at night is necessary, and to what extent; therefore, I shall say no more on that head: but the article steam must be farther con-

fidered.

fidered, and indeed kept in view till it is entirely suppressed. If, then, by leaving a little air at each light in the night, does not completely draw off the steam and damp, recourse must be had to boring the bed; which is done by thrusting a large stick (such as the handle of a fork, &c.) into the sides and ends in six or eight places, less or more, according to the heat of the bed. The holes ought to be kept open, by probing them every day, as long as there is any steam in the bed; and then closed, to prevent it from cooling too much.

I have feldom found it necessary to line Asparagus beds; yet sometimes, in a storm, it is requisite. This should be done with caution; and never more than one side at a time. Let the dung for this purpose be prepared in the same manner as for the bed, at first; then cut, with a sharp spade or dung knife, the part you intend to line, perpendicularly by the side of the frame: reject the tan and turs, and the rest may be used along with the new dung, unless very much wasted. From twenty-sour to thirty inches will be a sufficient breadth for the lining; raising it to about six inches above the bottom of the frame, and observing to tread it well towards the old dung, and giving it a considerable slope on the out-side, which naturally makes it lean that way.

If the lining should raise too great a heat in the bed, or cause any steam, you must draw it off, as directed above; and, when it has done subsiding, let it be turfed in the same way as the bed was.

Water has not yet been spoken of; and I can truely, though frivolously, affert, that I have fre-

quently produced a whole crop of Asparagus without "either earth or water." This, however, is not always the case, nor is it desirable; as, if a little water is not required, the dung must be in too moist a state, and consequently too much noxious vapour must have attended the whole process. It will be advisable, however, to be sparing in the use of that element; as, at this season of the year, and in this country, we have but too much cause to lament the absence of that luminary which is the very essence of vegetation.

When the buds have advanced to the length of three inches above the surface, they are then sit for cutting, as, by that time, they will be six inches in whole: and that operation must be performed with great care, as the buds will rise very thick. The tanbeing of a loose nature, there is no difficulty of thrusting down the singer and thumb to the crown of the root; and, as forced roots are of no use afterwards, I prefer twisting off the bud to cutting it, least the others that are rising should be injured.

A three light frame (which is generally ten or twelve feet long, and five or fix broad) will contain a number of roots; and, after it is fairly begun, will produce an ordinary dish every day for fifteen or twenty days. If, therefore, a succession of grass is required, it will be necessary to make up a second bed about eight or ten days after the first, and a third about three weeks after the second; which last time will be about a medium for each successive bed: but of this the operator will be the best judge; as much depends on the strength and quality of the roots, and the consumpt of the family.

In many places, it is probable, there may not be fuch a thing as old tan; as a substitute, I would recommend light, fandy, mixed with a fourth part of vegetable, mould. Indeed I am convinced, that entire vegetable mould from decayed tree leaves would be the best of all for forcing Asparagus in: but this I do not know from practice; as I have always found that article too precious an ingredient for other more valuable purposes, to lavish it on the forcing of Asparagus. But, to wave that confideration, I do not think it very material in what kind of mould it is forced, providing it be light enough; as I am convinced, from long observation, that the roots draw no fort of nourishment from the mould, a small degree of moisture being all that is necessary to the production of their buds, after which the roots perish. The only reason of my using old tan was, the scarcity of light, or vegetable mould, and the plenty of the former (otherwise almost useless) article. much I can affirm, that, by using the tan, you may produce your buds five or fix days fooner, in as great perfection, and with a better colour, (providing it be used perfectly dry,) than with mould of any kind.

I come now to the forcing of Asparagus in flued pits; which, in my opinion, is by far the most eligible method. I would not wish to infer from this, that any gentleman ought to be at the expence of erecting a pit solely for the forcing of this article. A pit such as is represented by Fig. 1. Plate I. will completely answer this, as well as many other pur-

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pofes;

poses: and the trifling confumpt of suel, even where it is most valuable, ought not to deter any, who are lovers of gardening, have sine gardens and hot-houses, and require Asparagus, French beans, sallads, &c. at an early season, from building so useful a compartment in the forcing garden. Farther, if a scrupulous attention is paid to the design in general, particularly to the construction of the sire place and slues, I can be bold enough to affert, that it will give more satisfaction to the gardener than any hot-bed whatever, and in the end will be a saving to the proprietor *.

The pit (See the plan) is about four feet in the back, and three in the front, deeper than the bottom of the flues: which great depth is made on the pre-fumption that it may be frequently used for pine-apple plants; but, were it to be used for Asparagus alone, half the depth would be sufficient.

It is immaterial whether the pit is entirely filled with

^{*} In the construction of this kind of pit, as will be seen by the plate, the first course of the flue runs along the front, the bottom of which is about the ground level; and, as the outer wall of the flue is only a brick on bed, it is obvious, that early cellery, carrots, lettuce, radish, caulislower, &c. &c. sown on a well prepared border about two feet broad, immediately adjoining the breast of the pit, would reap infinite advantage from the flue. At the time of any operation within the pit, a broad plank, supported by bricks, &c. would defend the crop on the border from injury. This hint is not from speculation; I have practised it for many years; and would feriously advise every gardener to do so on all occasions, where it will answer, as I have always found the plants so raised, to be preferable to those raised on hot-beds.

with tan or not; I have frequently used three fourths stable dung, prepared in the same manner as for a hot-bed, with equal success: but have always found that the dung is worse to manage than the tan, as it is more liable to heat violently; besides, from the nature of the building, there is no possibility of drawing off the rank heat, as in a hot-bed; for which reason, if dung is to be used, it ought to be sweated more carefully.

A very small degree of bottom heat is sufficient, for the purpose; and, if the pit has been previously employed with young pines, it will require no preparation whatever for the reception of the asparagus roots, excepting to level and put a few inches of very rotten tan on the surface. But, if melons were the last thing the pit produced, it will be necessary to stir up the bed about two feet deep, and add a little new tan or dung; then level the furface with old rotten tan, as before. In either case, let the surface be levelled in a floping manner to the fun, about fix inches above the bottom of the flues, allowing for the tan fettling fo much; then let the roots be placed and covered, as directed for the common hotbed. If the pit is from twenty to thirty feet long, one half will be fufficient at a time; and, to keep a constant succession, fill the other half in about fifteen or twenty days, which will begin to come up before the first is all used; after which, once a month or fix weeks, according to the fize of the pit and confumpt of the family, will be fufficient, till it be fit for cutting in the open ground.

Make no fires, if the thermometer stand as high

as 48 to 50 degrees; and, if necessary, cover with mats at night; also, admit plenty of air through the day, if the weather will permit. When it is necessary to make fires, let it be done with caution: a small fire made in the evening will generally serve the whole night; and it will be unnecessary to make any in the morning, unless there is a great storm. I have sometimes, however, sound it convenient to make a small fire in the morning, that I might have it in my power to admit air, and at the same time keep up a proper degree of heat.

Water will be required in a more plentiful degree than recommended for the hot-bed, as the fire heat will absorb the moisture considerably. Let a due observation of the state of the tan, the health of the buds, and the discretion of the gardener, always de-

termine that point.

In filling the first end of the pit a second time with fresh roots, it will be unnecessary to stir up the tan, &c. and perhaps it may be so even the third filling: but, by keeping a thermometer plunged in the bed, or watch sticks, you will be enabled to judge. At all events, there will be no necessity of adding fresh materials; as I have always found that trenching the bed to the depth of two feet, or so, has answered the purpose for the whole season.

If dung or oak leaves are used, let the bed be turfed, and at least a foot of very rotten tan or light mould laid on, before you place the roots.—This precaution is unnecessary where tan alone is used; in which case, however, not more than an eighth part of new tan ought to be trenched in.

CHAPTER

CHAPTER II,

GUGUMBERS.

THIS fruit is in such estimation, (particularly about London,) that the early production of it has of late become an object of contention amongst gardeners; which has given rise to many experiments for the attainment of their object, viz. to have cucumbers on the table in the months of January and February.

Various are the methods that have been used to attain this end in this country; and a few have been successful, in one or two instances: but, the trouble and expence attending the operation has been found to be far inadequate to the satisfaction of the pursuers of this truely trivial object.

The objections to the old-fashioned method of forsing Cucumbers and melons on hot-beds composed entirely of dung, are, that the plants are apt to be burnt with too violent a heat, and blanched with the rank steam wherewith these beds abound.—These objections, I confess, are weighty; and, I believe, but too well founded in general. But, I have the happiness to say, that I have forced Cucumbers and melons these twelve years, and (twice excepted) have never had my plants injured in the smallest degree by too violent violent a heat, or too rank a steam; and, if my mode of practice, which I shall endeavour to explain below, is punctually followed, I statter myself it will be found to be the least perplexing, the least expensive, and the most productive of any yet laid before the public.

It is subject

It is subject of regret * that Mr M'Phial's method has failed of the desired success. Nevertheless, I believe not many gardeners regret it much; for (the object of trouble aside) it evidently tends to impoverish the kitchen garden, by depriving it (at least in a great measure) of its common and necessary resource for manure.

Trials have been made to force these fruits on the old beds of the former year, by the aid of new linings. This has also failed of success; as it hath been found that the old dung contains a more noxious damp than that of the new, and the frequent loss of heat in the linings occasions a constant perplexity. The same cause (too rank a heat and steam) gave rise to the trial of this method as the former.

Late crops of Cucumbers and melons may be raised with great success in flued pits, (I speak experimentally;) but I have ever found that early ones may be much better produced on a dung hot-bed. The cause is, that these plants delight in a mild, moist heat, and are impatient in a dry, sire heat. The latter, however, is of infinite service late in the Autumn, by drying off the external damp, and hastening the maturity of the late fruit.

Where

^{*} For himself.

Where tanner's bark is plenty, and the more valuable material, dung, is scarce; these fruits may be successfully produced by composing the bed of bark, with as much dung or litter as will suffice to build the out-sides; or by building retaining walls of brick, stone, turf, &c. and sitting the frame thereto: but care ought to be taken that the roots of the plants, at no stage of their growth, touch the bark, which never fails to canker them.

It is a practice with many to fink their hot-beds, or at least partly so; and this is generally done with too little discrimination. I am far from disapproving of the practice, providing it can be done with propriety, as it gives a degree of neatness to that department of the garden: but this ought to be a secondary consideration; for, if the situation is naturally damp, and care is not taken to render it perfectly dry, disappointments will inevitably attend the labours of the gardener.

It is customary, in this country, (Scotland,) to prepare seed beds for Cucumbers about the middle of December, or first of January. The latter time I prefer, but most of all the first of February; as I have often myself, and seen others, been put to more trouble and perplexity with a seed bed at that early season, than with all the rest of the framing for the whole season thereafter, and all to no purpose: for experience shews that plants * sown about the first of February will

^{*} I wish to be understood as speaking generally—there may be many exceptions: I also mean plants of the same fort.

will succeed better, and produce fruit sooner, than those sown at any period preceding.

Some raise seedling Cucumbers and melons in pine stoves, dry stoves, early-forcing houses, &c. and transplant them into dung hot-beds. But, it must be confessed, they are not equal to shose raised in a seed bed prepared for the purpose; as in the one they are but a secondary object, whereas in the other they are the principal; besides, there is a great disparity of climate.

Cucumbers are often produced with success in boxes placed in the pine stove, &c. at an early season: but, as the heat of the stove is not regulated for their sakes, it may be unnecessary to say more on that head, than that they should be placed in the most airy situation, silled with rich light compost, and duly refreshed with water.

Having premised this much, I shall proceed to treat on the culture of the Cucumber on a dung hotbed; and that on the supposition of their being (or

rather to be) fown on the first of February.

On or about the twentieth of January, let a sufficient quantity of the very best mixed stable dung be thrown together in a heap to sweeten, which let lie for five or fix days; and then turn it over and shake it well up in a second heap; in which condition let it lie till the first day of February, when it will be ready for building the bed; which I shall suppose is for a one light box of any size.

Proceed to build the bed; observing to keep it at least eighteen inches larger than the box all around,

and

and to the height of five feet in the back, and four in the front; observing to beat it well with the fork as you proceed; and, if the dung is very littery, tread it equally once or twice. When at the height, let it be carefully turfed in the fame way as directed for the asparagus bed: place the frame thereon; in which lay sea or pit sand of the finest quality, previously rendered perfectly dry, in a floping manner corresponding with the light, and to within fix inches of it; over this lay two inches of light fandy loam, of any kind. Then, in a garden pot or pan, about fix inches diameter, filled with entire vegetable * mould from decayed tree leaves, fow your feeds, and cover them with half an inch of the same. Plunge the pot or pan to the brim, in the centre of the bed the one way, and at a foot from the back the other. Put on the light; and cover at night with a double mat.

The bed will begin to heat in twenty-four hours, and must then have a little air admitted by tilting the back of the light an inch or so; and the front half as much +, in order to pass off any noxious vapour that may have arisen. Let the frame be matted every night at sun-set, and uncovered by eight in the morning, or sooner, if the state of the weather will permit; and, from the moment the plants begin to appear, as due attention ought to be paid to this article as that

^{*} The method of preparing this mould will be treated of in another part of this work.

[†] This rule ought always to be observed, unless the severity of frosty winds renders it hurtful to the plants.

of air and water. Every gardener has to lament, that, in this country, and at this season of the year, our days are not only short, but dull and hazy, to a degree that is but little known or felt in our fifter country; and it follows, that the least neglect in admitting the rays of light, which is so necessary to the health and vigour of the plants, is, flrictly speaking, unpardonable. A little kindly steam in the morning is a good symptom; but this ought never to be encouraged to any great extent: I never wish to see more steam in the bed in the morning, than what entirely disappears with the first hour after the frame has been uncovered *. Examine the bottom of the pot or pan frequently; and, if the heat should rise too violently, raise them a little, to prevent their young fibres from being fcorched; and, if necessary, place it entirely on the furface; and, if requifite, give a little water, which should have stood in the frame, or any other place of equal temperature, for feveral hours before.

When the plants have arrived at the height of about two inches, they will be fit to prick out into nursing pots, which should be about four inches diameter, and about the same depth. Put them into the same mould they were sown in, and three or sour in a pot, placing them as far apart in the pot as possible; and settle the whole with a little water. Plunge them to the brim in the bed again, which should previously

^{*} In treating of the cultivation of asparagus on a dung hotbed, I have given ample directions for drawing off the rank steam; which I hope will suffice the reader for that operation, when necessary, in hot-beds, at any time.

be worked over the whole depth of the fand, and about two inches of the fame fandy loam laid on the furface, as at first. Attend to them in the articles of air, steam, and water, duly, while they remain here, according to the state of the weather; and frequently examine the bottom of the pots, least their roots should be scorched.

In the mean time, let dung be in preparation for a one, two, or three light frame, or more, according to the quantity required, in the manner directed above; and, when the plants have each got four rough leaves, let the bed or beds be built for their reception, in the fame manner as directed for the feed bed. If, from the state of the dung, you have reason to dread its heating too violently, let the beds be turfed all over, as before directed; but, if it has undergone a proper fermentation, a large round turf placed in the middle of each light, exactly under where the plants are to be placed, will generally answer the purpose. But, previous to the turf being laid on, (in the latter case,) let the furface of the dung be covered, to the thickness of half a foot, with light fand, or well-rotten old tan, which should be rendered perfectly dry beforehand.

Put on the frame * and lights, and cover at night with matts, to draw up the heat; which when it has arrived at a moderate degree, let three wheel-barrow B loads

^{*} The frame ought to be thirty inches deep in back, and twenty in front.

loads of mould * be spread equally over each lightbreadth of the bed. In twenty-sour hours after, the bed will be fit for the reception of the plants. But, previous to planting, gather up a sufficient quantity of the mould, from the surface of the bed, to raise hills, exactly above each turf, or in the middle of each light, to within five or six inches of the glass, and the breadth of ten or twelve inches at the top. Make a hole in each to receive the ball entire, (which must be carefully taken out of each pot,) and to the level of the surface of the hill; and settle the whole with a little aired water.

On the prefumption, that the heat, steam, airing, and watering, shall be regulated according to the directions already given, the state of the weather, and the vigour of the plants, till they begin to shew fruit; I shall say no more on that head at present, but shall return to it after having considered the article pruning or stopping. That it is indispensibly necessary (as some pretend) to pick out the heart-bud when the plant hath formed its rough leaves, I can by no means subscribe to; for, from the most minute observation, and the fairest trials, which I have repeatedly made, I am convinced it is of no manner of consequence whether the bud is picked out or not: I seldom think of picking or pinching till the plant begins to put forth

unnech any to pich and of heart but

* Three fourths of the richest black loam that can be got, (from a pasture if possible,) and one fourth of vegetable mould from decayed tree leaves, mixed well with a competent share of stable dung, is what I have used for years with great success.

forth runners or vines, nor even (unless it happens to put forth too few to furnish its side of the frame) till I perceive the rudiment of the fruit. It is then time to stop those vines which have fruit shewn: but the others may be suffered to run to the length of six or eight joints; and should then be stopped, to cause them put forth fertile ones, which they will seldom fail of doing if the plants are healthy.

If an extraordinary quantity of male bloffom should appear, let a part of it be gently rubbed off with the finger * and thumb; but I do not approve of this being done when an ordinary shew of these blossoms only appear. Nature should be kindly assisted; but neither spurred nor thwarted, where it can be avoided. When the female bloffoms are fufficiently advanced, let them be carefully impregnated with the strongest'and most healthy of the males, which will greatly promote the fwelling of the fruit. And let it be here observed, that, if the fruit or female bloom is not impregnated with the male, it will not ripen its feed although the fruit may swell to a good fize, and be very fit for the table: and although it often happens that the farina of the male is carried, by infects, &c. and the wind passing through the frame, to the object of its destination, yet it is a surer way to

* I would here observe, that the knife ought never to be employed in the pruning of Cucumbers and melons, unless in cutting out any strong old vines; and as nothing is more brittle than the leaves of these plants, when in a healthy state, they ought to be handled at all times with the greatest care and delicacy.

be at the trifling trouble of doing it with the hand, as handsome set fruit can be set aside for seed with a

greater degree of certainty.

If no accident hath happened the plants, they will have made good progress before the bed has in any great degree lost its heat, and indeed generally a few of the first set fruit are cut * by that time; which, suppofing the bed was built about the middle of February, and the plants planted about the twenty-third or twenty-fourth, should be fit for cutting by the middle or latter end of March, if the weather has been tolerably favourable. If the heat has by this time confiderably decreased, let preparations be made for lining the back and both ends, by flightly fermenting a quantity of fresh stable dung, and mixing it, in the operation, with the old fide and ends of the bed; which let be cut off in the manner as directed for the afparagus bed, (See page 5,) and let it be made up as it fubfides: after which, cover it with turf or mould. And the frame must be raised with bricks or tyles occasionally, as the plants advance in strength; so as to keep the glass free of the foliage. By this time, also, the hills will require to be enlarged; as the roots will have made great progress. Therefore, let the surface of the bed be forked up with a small hand-fork (such as is used for plunging pine pots, &c.) to the depth of

^{*} This depends much on the kind of Cucumber fown; and, as the kinds are now so numerous, and almost every gardener having his particular favourite, it might be deemed presumptuous in me to say which ought to be preserved, especially as many known kinds have an equal title.

of the furface of the fand or tan; and, if any of it has been burnt, (which I have but twice experienced in any hurtful degree,) let it be replaced with fresh mould: work gently into the sides of the hills with the fork till the roots begin to appear, and, if needful, pour in a little water: after which, let the whole bed be levelled up to the height of the hills with fresh mould of the same quality as at first *. This operation, however, should either be done a few days before the application of the linings, or deferred till a few days after; that the plants may not experience a check, by the bed being cooled both without and within at the same time.

The plants will now grow vigorously, and produce fruit in abundance: and must forthwith have a large share of fresh air every day, encreasing the quantity as the season advances; and, when the month of May arrives, in sine mild weather the glasses may be entirely taken off in the day time. Let them have large and frequent quantities of water given from the rose of a watering pan; taking the advantage of warm showers as the season advances. Few plants require more of this element than the Cucumber; and if it is

^{*} I have here directed the bed to be earthed entirely up at once; which, if the forcing is not begun sooner than recommended above, will be found quite sufficient: but, if the forcing were begun a month or six weeks earlier, it would be imprudent to earth up the bed entirely at once, as a stronger bed and more linings would be required; and, consequently, the risk of burning the roots would be greater. Fifteen inches is a good medium for the depth of mould above the tan or sand.

with-held, the plants will (to the nice observer) quickly complain.

Keep them moderately thin of vines and leaves; taking care to lay them all out in regular order, and not have them crossing one another. Be also careful to divest them of all withered and damped leaves, &c. It is as obnoxious for a plant as an animal, to breathe the air wherein its own corruption is confined.

About the beginning or middle of April it may be necessary to line the front of the bed, which let be done in the same manner as the back and ends; but it will be quite unnecessary to renew these, as that of the front will throw in a kindly heat, which will last all that month, after which bottom heat is of little consequence.

As I mean to treat of the raising of melons in flued pits, when the culture of that plant is treated of, and as the treatment of the two plants are so nearly similar; I shall only observe here, that the same mould must be used for the Cucumbers as recommended above, and a greater portion of air and water given than for the melons.

The culture of Cucumbers under hand and bell glasses, although a species of forcing, being so generally understood, and insusceptible of any improvement; it is unnecessary to waste time in saying more on that head, than that they should be planted in mould of the same quality as above directed, should have plenty water given them in hot weather, and as much

much as possible defended from cold and damp in Autumn.

I shall conclude this article by observing, that I have never known any insect to insect the Cucumber, except the aphis, which, in any state or situation, is quickly destroyed by the sumigation of tobacco; a process that is familiar to almost every gardener.

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CHAPTER

CHAPTER III.

CHERRIES.

SECTION I.

On the Construction of the Cherry House.

HE production of this justly-esteemed fruit at an early feason has much obtained of late years; infomuch, that many of our capital gardens are furnished with a compartment for the purpose. These are of various constructions; occasioned sometimes by the fancy of the constructors, the subserviency to other purposes, and the converting of places that were originally erected for the production of other fruits or plants, to that of the Cherry: in all which, where properly managed, it has given general satisfaction. Consequently, it might be thought ambiguous in me to fay, that a Cherry house should be of fuch and fuch a construction; nor do I wish to advance fuch a proposition. But, where it is in contemplation to erect one, I would recommend fuch as is represented by Fig. 1. Plate II. which, besides being perfectly adapted to the forcing of Cherries, is alfo to that of strawberries, kidney-beans, flowers, &c. The

The fire (See the plan) communicates first with the front flue, and then has two returns in the back wall; which returns are made on the presumption that the house may be converted into a vine or peach house at pleasure: but, while it is appropriated to the forcing of Cherries, it will be improper to use any but the front slue; and of consequence the back slues must be shut by a damper. My reasons for which are, that a very small degree of fire heat only is requisite, (even at an early season;) and, the Cherry being so subject to the red spider, the working of the bark slues would greatly encourage the breeding of that destructive insect.

SECTION II.

On Preparing the Border, and Planting the Trees.

I F the fituation is dry, the bottom a kindly fand, gravel, or clay, and the foil a fandy loam to the depth of two feet; the border will require no other preparation than being well enriched with stable dung, and if possible a little marle; which ought to be trenched and well mixed twice or thrice during the Summer before planting.

But, if the situation is wet, the bottom a cankering gravel or cold clay, and the soil either a poor sand, gravel, or stubborn clay; care must be taken to render them otherwise, by paving the border to the breadth of twelve or sourteen seet, running a drain in front to carry off the wet, and removing the bad, and bringing in good foil; so as to compose a rich sandy loam to the depth of thirty inches at the wall, and twenty-four in front, allowing three or four inches for settling. If a new building is erecting for Cherries, it is immaterial whether the building or border is compleated first, (providing the latter has a sufficient time allowed for the mixing and incorporation of the soil;) as the front wall and slue stand on pillars, whose foundations ought to be at least fix inches deeper (if the border is not paved) than the soil.

About the first of January is a good time for planting; although a month sooner or later at this season is of little consequence, as there must be no fire heat applied the first year. Having provided the necessary number of healthy, well-rooted, maiden, or oneyear-trained May-dukes *; let them be planted against the trellis at the distance of eight, nine, or ten feet, according as the length of the house will best divide; filling in the pits with vegetable mould from decayed tree leaves, and fettling all with a little water. Riders, with five or fix feet boles, which have been trained two or three years against a wall, and have produced a crop or two, should be provided to fill the upper part of the trellis; where they will produce a few crops before the dwarfs require their removal. These will generally produce a few fruit the first,

and

^{*} Experience shews that no other Cherry deserves a place in a forcing house.

and be fure to produce a full crop the second year. Let the surface of the border be forked over once a year, and a little well rotten dung occasionally worked in.

SECTION III.

On Training the Dwarfs.

THE dwarfs or principals being the only ones intended ultimately to fill the trellis, I shall discuss what relates to training the riders by observing, that, as these are planted solely for the purpose of obtaining a crop or two while those are making their wood and forming their fruit spurs, and, by being checked by their removal, may not be expected to put forth much young wood while they remain here, it will be unnecessary to thin them out much, but let them be dressed regularly to the trellis, and (where not absolutely requisite) divest them of any shoots they may make, paying respect to their fruit spurs only; for when they have served the purpose here, they will be of no farther use.

After planting, let the dwarfs, if maiden trees, be headed down to two or three eyes; in order to make them put forth vigorous shoots, to surnish the trellis, from the bottom: and, if they have been one year in training, let the bottom branches be laid well down, and the rest dressed in a regular manner to the trellis, using strings of fresh matting to tie with;

and be careful to allow fufficient * room in the ties, as much mischief is done to fruit, especially Cherry, trees, (which are so apt to gum,) if not allowed a sufficiency of room.

The Cherry tree being apt to gum, and the branches decay, from the slightest injury, it would be imprudent to train it horizontally; in which case, the loss of a branch is supplied with much more difficulty, than when trained in the fan manner: this last I therefore recommend.

When the tree hath produced its shoots to the length of five or six inches, let them be gone over and thinned, so as to enable you to lay them in at about the distance of ten or twelve inches; observing to pinch off any that are produced fore-right, and which are, from their appearance, not forming for fruit spurs: and, as they advance, let them be neatly laid in, and divested of any laterals they may produce. If all has gone well, at the end of the first year they will have produced shoots from twelve to thirty inches long; which should then be shortened to about two thirds of their length.

The second season, they will shoot vigorously, and will begin to form many fruit spurs on the preceding year's wood; which must be encouraged, for the production of a sew fruit next year. Keep the tree clear of all supersluous and lateral shoots; and lay in the leading ones at the distance of eight or nine inches,

^{*} I make it a rule to allow every shoot as much room in the shred, or tie, as will at least admit another of the same size along with it.

inches, which forthwith must be the medium: and, at the end of the season, shorten a sew of the strongest alternately, so as to make them break their buds in the Spring in a regular manner; as forthwith they will not require to be any more shortened.

The third season, they will produce a few fruit, make fine spurs and moderate shoots; which, as they advance to the riders, give place to, by lopping off their branches, or thinning away their soliage, so as to afford a free circulation of air and admission of sun.

The fourth season, they will produce a full crop of fruit; and will possibly make such progress towards the riders, that their presence must be dispensed with: in which case, it will be advisable to sacrifice whatever fruit, or appearance thereof, there may be on them, to the encouragement of the principals.

After the trees have filled their spaces, and have begun to produce plentiful crops of fruit, they will make little or no wood; and will require no farther care, on the score of training, than to supply the place of any branch that from accident may die out.

SECTION IV.

On the Temperature of the Cherry House.

THE Cherry, from its nature, will bear very little artificial (especially fire) heat. For which cause, I would not advise the forcing of it too early, especially if there is no more than one compartment for its culture; since, in that case, there would not be a continued

tontinued succession for the supply of a table, and furnishing a desert, till they came in on the open walls. I consider the first or middle of February to be an eligible time for the commencement of the forcing; but, in a new planted house, the third year ought to arrive before fire heat is applied. Were it not for the sake of other articles that may be placed or planted in the Cherry house, it would be better that the glasses were not put on the first season at all; but this is generally too great a sacrifice: however, if they are put on, a free circulation of fresh air, even in the night, ought to be encouraged.

Suppose, then, that, the third year after planting, the trees have made good progress, plenty fruit spurs, and that a reasonable hope of success is entertained; let the glasses be put on about the middle of January, plenty air admitted through the day, and shut up at night. On the first of February light the fire; which must be made so moderate, that, at eight at night, and eight in the morning, Farenheit's thermometer may not stand above 40°. In which condition keep it as near as possible till about the twentieth of the month; and then encrease the heat gradually to 45°: at which point endeavour to keep it till the fruit is fairly set. Afterwards encrease the heat to 50°, but not more, till the stoning is over, and the fruit are begun their fecond swelling. Although, for the fake of the fruit, all danger is then past; yet, if too strong a fire heat is indulged in, it will have the tendency of drawing the shoots too weak; and, therefore, I would not advise that the air of the house, at the fore-mentioned hours, should ever pass 60°.

SECTION

SECTION V.

On the Admission of Air to the Cherry House.

As already hinted, the house ought to be uncovered all the first season after planting: but, if this is not the case; and if, from the nature of what other plants are placed therein, it is imprudent to leave a little air in the house in the night; let it be opened by sun-rise in the morning, have a large and free circulation all day, and shut up at sun-set. However, when the month of May arrives, it ought to be entirely uncovered.

The second season, let the glasses be put on by the first of March; large portions of air admitted, as directed above; and the glasses removed by the first of August.

From the commencement of the forcing, this article must be more particularly attended to:—The first ten days after which, a very large share of air should be given, to prevent the buds from breaking too snddenly, and of consequence too weakly; besides, vegetation (in forcing) ought always to be brought on, as it were, by stealth: the juices flow more kindly; and the plant suffers the first impulse of reviving activity with more patience, than when hurried on in a violent manner. But, after the buds begin to appear turgid, a more moderate quantity may be admitted; still having respect to the temperature of the house, and the prevention of frosty winds from hurting the bloom. At all events, take advantage

of fun-shine; which will allow a larger portion than at other times. Nevertheless, let no day pass, (unless a severe frost,) wherein less or more air is not admitted; and, in sun-shine, to the extent that the thermometer may not rise more than 10 degrees above the fire-heat medium.

After the crop is all gathered, if confistent with the welfare of the other articles contained in the house, let the glasses be removed, and the trees exposed to the weather till the next season.

SECTION VI.

On Watering, Washing, and Steaming the Cherry House.

A FTER planting, let the mould be settled to their roots by a moderate watering; and, if the house remain uncovered the first season, little attention (except in dry weather) will be required in this article. Let due attention be paid, the second year, to keep the border in a moderately most state, that the plants may grow freely; and, when their growth is stopt for the season, with hold the water, that the wood may ripen perfectly before they are exposed to the weather.

From the time you begin forcing, give plentiful waterings to the border, until the bloom begins to open; and then in a moderate degree, till the fruit is fairly set. After which, again encrease the quantity, till the fruit begins to colour; and then diminish the quantity by degrees, till you entirely with hold

it, which ought to be done some time previous to the fruit's being ripe.

Washing with the hand engine should commence with the day you light the fire; and, except from the time the bloom begins to appear, till the fruit is fairly set, should be repeated thrice a week in the evening, and that with a considerable degree of force, till the fruit begins to ripen.

In the interval of washing, (viz. while in bloom, and till the fruit is set,) let a little water be poured on the flue every evening when the fire is at the strongest; which will cause a fine agreeable steam * to arise in the house, greatly to the benefit of the flowers and foliage.

Soft and tempered water should be used at all times, and on all occasions.

C SECTION

* I do not consider the Cherry house of that consequence, to be at the expence of erecting steam apparatus purposely for its use; nor, indeed, do I think it worth while to do so for the use of any kind of forcing, except a range of peach houses: in the near neighbourhood of which were it placed, a pipe might (if at a small expence) be borrowed for its use. But, at all events, I preser steam produced from an earthen slue, to that produced from boiling water.

SECTION VII.

On the Infects that infest the Cherry House, and how to destroy them.

THESE are, the aphis, or green fly, the acarus, or red spider, the caterpillar, and the grub. The first, and least hurtful, is easily destroyed by a sumigation of tobacco. The second, by the process of washing with the engine, which is indispensibly necessary to the health and vigour of the trees, I have ever been able to keep my forcing houses of all kinds clear of. Therefore, when they begin to make their appearance at any time, let the water, in the ordinary course of washing, be thrown against the trees with greater force, making a point of beginning at the contrary end of the house each time; whereby, if you happen to miss any part the one way, you may strike it the other.

The caterpillar and grub have given me more trouble than the preceding, or indeed any species of insect whatever; and, after trying a variety of prescriptions, being at much trouble and expence, I can venture to assure the reader, and the public at large, that I have at last discovered a cure: the receipt of which I shall candidly give; and hope that none will attempt to use it without giving it a fair and candid trial.



Take of fost soap, two pounds; slowers of sulphur, two pounds; leaf, or roll tobacco, one pound; nux vomica, two ounces; and oil of turpentine, an Eng-

lish

hish gill: boil them all together in eight English gallons of soft or river water to six; and set it aside for use.

Any time in Winter, at least a considerable time before the trees begin to vegetate, let them be all untied or unnailed from the trellis or wall; brush every part of the branches and buds clean with a soft brush, such as is used for painting: make the liquor milk warm; and, with a spunge, carefully anoint every part of the tree, trellis, &c. Dress the trees neatly to the trellis again; but use none of the old ties or shreds: and let this operation be repeated every Winter * without reserve. The first Summer after anointing there may a few appear, whose eggs have, by being concealed, escaped the action of the liquor, which must be picked off, to prevent their breeding; but, if any, there will be very sew, as it is of the most penetrating nature.

This liquor must on no account be used in Summer, as it instantly destroys the foliage; the fatal effects of which myself once experienced, through inadvertency. Fruit trees of all kinds should be anointed with this liquor every year; as it is equally destructive of every insect, and their eggs, which insest them: but surely none, who have the health and beauty of their hot-houses at heart, after being convinced of its efficacy, will be so neglectful of their own interest, as to omit the doing of it.

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SECTION

^{*} This precaution is necessary, these insects being evidently blown by a fly in Summer.

SECTION VIII.

On the Cultivation of Cherries in the Conservatory and Peach House.

CHERRIES are often brought to early perfection in these forcing compartments; by being sometimes planted in pots, sometimes in the borders as low standards, and sometimes as rider standards: all which methods are attended with various success, from the circumstance of their being a secondary object.

Having, in the seven preceding sections, treated methodically of the cultivation of this fruit; it may be unnecessary to enlarge more on it here. I shall therefore pass over the farther consideration of trees planted in the border; and conclude by dropping a few hints on the utility of cultivating a few dwarfs in pots or boxes.

Where there is an extensive variety of forcing, and a green house, or conservatory, Cherries may not only be produced at an early season; but in a long succession, by removing the pots or boxes from one house to another. Suppose you have twenty or thirty trees, let them be divided into sour or sive equal parts, to make as many successions; and let them be placed in equal rotation: first, (in November or December,) in the green-house, where let them remain till they are fairly set; then, in an early peach or vine house, till they begin to colour;

and,

and, lastly, in the pine or dry stove, to come to maturity.

Let very rich compost, such as is used for cucumbers or melons, be made use of; and water them frequently with the drainings of a dung-hill. Wash or water them also frequently over head with a hand squirt or watering pan; and place them in the most airy situations.

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CHAPTER

CHAPTER IV.

GRAPES.

SECTION I.

On the Construction of the Grape House.

THIS delicious and justly esteemed fruit is now cultivated with such general eagerness in this country, that a garden unprovided with one or more compartments for its production is not only reckoned incomplete, but hardly to be met with *. These vary exceedingly in construction; and, although some lay great stress on this article, and there are extremes which ought not to be followed, yet I am convinced the failure of success, in the production of the Grape, is much less a consequence of bad construction in the house, than in the preparation of the border, the choice of the kinds, and the general management. It has fallen to my lot to have the construction and management of three several and differently constructed

^{*} I would here wish to be understood as speaking of noblemen's or gentlemen's gardens in general, although there are some Grape houses in market gardens.

structed grape houses, in the same garden *, under my care, for years, which have equally and uniformly produced excellent crops. This, in my opinion, is a proof of the necessity of a greater niceness in the formation of the border being observed, than in the construction of the house; the sire place and slues excepted.

A command of fire heat is absolutely necessary in the Grape house; to effect which, great attention should be paid in the construction of the fire place

and flues.

Fig. 1. Plate V. represents a furnace, and the entrance to the flue, on a plan that has given the utmost satisfaction for many years: and although I should be forry to advise unnecessary alterations in houses already built, yet I could wish to see all hot-house surnaces on the same plan; from a conviction of the utility, not only in saving suel, but in enabling the operator to work with a degree of exactness, and enjoy a less disturbed repose in winter nights, than is generally done.

Fig. 1. & 2. Plate III. represents two different plans of Grape houses; and which, if minutely copied, will not fail of giving satisfaction. Any alteration in the breadth and height, I would beg to caution against; but the length may be extended or lessened at pleasure, providing respect is paid to the propor-

tion of fire heat here allowed.

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SECTION

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Wemys Castle.

SECTION II.

On the Situation and Preparation of the Border.

THE fite of the Grape house is an object of such consequence to the welfare of the plant, and successful cultivation and production of well-flavoured fruit, that the greatest care is necessary in the choice of it; and, where it is not naturally a good one, the sparing expence, in rendering it so, is the cause of many disappointments. I shall, therefore, point out what I esteem a good one, and the method of rendering a bad one so.

A gentle hill, having a fouth aspect *, and considerable declivity that way, the foil a strong brown loam of two feet, over a bottom of dry fand, gravel, or foft clay; is the most desirable, and would be the least expensive of all situations. In which case, the border would require no paving or draining; and would admit of a proper mixture of fandy loam, vegetable mould, marle, and dung, (by the removal of two feet of the natural bottom,) with the natural foil, to form a border, perfectly adapted to the growth of the vine, in the following proportion, viz. One half strong brown loam, a quarter light sandy loam, an eighth vegetable mould of decayed tree leaves, and an eighth stable dung; to which add about a fiftieth part of shell marle. Such is the composition

^{*} All hot-houses should face the meridian sun.

of the vine borders at Wemyss Castle; none of which are less than four feet deep, and one (owing to the accidental situation of the house) is six.

The breadth of the border for a house as reprefented by Fig. 1. Plate III. should be all the breadth of the house within, and at least twelve feet without; and for such a one as is represented by Fig. 2. should be to the extent of fourteen feet beyond the front wall.

Having shewn the composition, breadth, and depth, the borders should be of, in a good situation; I shall only observe, in respect of the contrary, that, if it lies low, damp, and flat, it will be advisable to raise an artificial hill, to the height of three seet above the common level, (allowing the surface to be one foot deep of tolerable soil,) composed of the above-mentioned materials, which may be mixed with the natural soil, and of the full breadth as afore-said: pave the bottom in a sloping manner all round, and, if necessary, run drains to carry off the wet; and here erect your Grape house.

As the plants are to be planted within the house, it is obvious, that both the front wall and flues must stand on pillars; whose foundations must be to the depth of the pavement in the one case, and six inches deeper than the soil in the other.

The compost must be well prepared, by trenching and mixing, three or four several times during the Summer

^{*} For a more economical method of making a bottom, see Appendix, Section ii.

Summer preceding planting; and the building may be going on at the same time.

Let the surface of the border, both without and within the house, be forked up annually, and a little rotten dung worked in. Hence it appears, that I by no means approve of the border without the house being made a walk of, as directed by some; nor even being cropped with vegetables, unless in a very slight degree. Wooden walks should be used within the house, composed of spars placed within two inches of each other, to the breadth of eighteen inches, and supported from the ground by tiles or bricks.

SECTION III.

On Preparing the Plants.

If plants of proper kinds, and which have been one or two years in pots, cannot be procured, recourse must be had to producing young ones by cuttings, which is the most certain and speedy method. For this purpose, in the pruning season, make choice of a quantity of the under part of the best ripened, roundest, and shortest-jointed shoots of last year; which let be cut off with two inches of the former year's wood*, headed down to three eyes, tied

^{*} Mr. Speechly mentions feveral methods of making vine cuttings; and particularly recommends that by one eye. I have given them all fair and frequent trials; and, after all, am inclined to stick by the old-fashioned Mallet method. I

tied in parcels, numbered and registered according to their kinds, and stuck into the earth in a dry situation till wanted.

About the first of March, let a bed, in all respects the same as that recommended for asparagus, (See page 3) be provided; observing to lay a few inches more of old tan on the surface, and of a size corresponding with the number of cuttings required. Take garden pots about six inches diameter, and the same depth; fill them with entire vegetable mould of decayed tree leaves; place two cuttings in each, so deep as to cover the undermost eye an inch; and plunge them to the brim in the tan. Cover at night with mats, if necessary; give plenty of air, ingood weather, through the day; and refresh duly with well aired water.

The plants will grow a-pace: and, to their encouragement, let the bed be lined, when necessary; and, as the shoots approach the glass, let the frame be raised with bricks, &c. By the time they have made shoots to the length of five or six joints, they will require fresh potting; and must be put, singly, into pots of nine or ten inches diameter, filled with half vegetable and half melon or cucumber mould, divested of all but one shoot, (which ought to be dressed to a rod,) and placed in a vine house, pine stove, or a slight hot-bed,

have always found the strongest plants to be obtained by it.

—But, to make the most of a rare kind, the method by one eye is of great advantage. It is performed by cutting off the bud, with half an inch of the shoot below, and one inch above, in a sloping manner; and placing it against the side of the pot facing the sun, to the depth of half an inch.

hot-bed, previously prepared; where let them be duly attended to in the articles of air and water (sometimes the drainings of a dunghill) during the remainder of the season.

Pinch off all laterals and tendrils as they appear; dress them neatly to a rod; and, when their growth is over, and the wood fairly ripe below, head them down to three or four eyes, and place them in the open air, in a dry and airy situation, till the planting season.

SECTION IV.

On Planting, and the Kinds best adapted to, the Grape House.

In the house Fig. 1. Plate III. four feet between the plants is the distance they should ultimately stand at; and in the house Fig. 2. six feet; but it will be proper to plant them at half the above distances, as a crop or two may be obtained before it will be necessary to thin them out; observing to place the kinds two and two together, that, in thinning alternately, any of the kinds may not be totally extinately.

Suppose, then, that the house is built, and the border has been prepared conformably to the directions given in the last section, and that the plants are in readiness; let pits be made, at the above distances, eighteen inches deep, and as much diameter; fill them half with vegetable mould; take the plants carefully out of the pots with the balls entire, and (unless mat-

ted) place them so in the pits, filling in with vegetable mould, and settling them with a little water. This operation may be performed any time from the first of November to the first of March with equal success *.

Amongst the numerous variety of Grapes, I do not know above eighteen or twenty kinds worth a place in the vinery, and even that number cannot have places in an ordinary sized house; but, where there are two or three houses, a variety to the extent of twenty-four kinds may be encouraged, without transgressing the bounds of moderation. The following is a list +: viz.

White

^{*} On the first day of May 1793, I planted a Grape house with young plants, struck in February. In 1795, they had a few fruit; and in 1796, the best crop I ever remember of seeing.

[†] Mr. Speechly enumerates fifty kinds; and elegantly defcribes their flavour and appearances. But, as I by no means approve of fo vast a variety, and as the kinds I have enumerated are pretty generally known, I have spared myself the trouble of describing them; referring the curious to Speechly's 'Treatise on the Culture of the Vine.'

addition of the only in the office of the

White sweet Water. Syrian.

White Muscadine. White Tokay.

Royal do. Flame-coloured do. White Passe Mosque.

Black Frontinac. Grecian.

White do. White Muscat of Alexandria.

Red do. Black do.

Grifly do. Large black Cluster.

Black Hamburgh. Black Constantia.

White do. White do.

White Raifon. St. Peter's Grape.

Red do. Lombardy.

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Out of which, according to the fancy of the proprietor, may be chosen an ample collection to stock any Grape house.

SECTION V.

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On Training and Pruning.

In the last Section I have observed that the plants should be planted at double thickness, in order to furnish the house, and obtain a crop or two while the temporary plants remain; these must be marked, and considered as such from the beginning: and, as the farther mention of them in respect of training and pruning would only tend to consusion, I shall simply treat of the principals; leaving the thinning away,

and final extripation of the temporals, to the judgment and discretion of the operator.

The plants being headed down to three or four eyes, (as directed in Section third,) will generally push them all; in which case *, rub off the weakest, and dress in the other three, as they advance, at the distance of from nine to twelve inches. Pinch off all tendrils and laterals as they appear; making a rule, however, of leaving all the laterals above the last tie, which should never be nearer the extremity of the shoot than ten or twelve inches; as that part, being fo very brittle, is apt to break, should it meet with any obstruction, and at the same time be confined too near the point. In case of which, it is advisable to leave the laterals, as above hinted; that one of them. may lead on the growth, and become a substitute to the proper shoot. When the two side shoots have arrived at the height of four or five feet, they should be stopped, in order to throw in the more strength to the middle one, which must be encouraged, and fuffered to grow without interruption the whole feafon; not only on its own account, but on that of the roots, whose progress always bears pace with that of the

^{*} The knife should be used as little as possible; and, the young shoots being of so tender and brittle a nature, there is no difficulty in doing all, that is required in summer dressing, with the singer and thumb, except in cutting out any old sterile branch: which, however, ought never to be done before the slowering season; as, previous to that, much injury would be done by the plants bleeding, which never happens afterwards.

the branches. The uppermost lateral of the side shoots, after being stopped, will push; which suffer to grow two or three joints, and then stop again, otherwise the uppermost eye of the proper shoot will break. Repeat this operation, on the lateral produced by the first lateral, as occasion requires, till the growth of the shoot is quite stopped.

When the plant has done growing, the wood ripe, and the leaves begin to drop; it is then the proper time for pruning *. Let the middle shoot be headed down to three, four, or five feet, according to its strength; and the two side ones to two eyes each.

Next feafon, the plants will push vigorously. Train the uppermost shoot of the middle branch to the top of the house; stop the lowermost of said branch + when it touches the bottom of the former; and, if the intermediate ones should shew fruit, leave two or three with a cluster at each, and rub off all the rest. Train the strongest, from each side branch, to the height of eight or ten feet; and stop the others at four or sive eyes each.

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^{*} This operation should never be deserred longer: for, if it is, it rarely happens that the plants do not bleed in a greater or less degree, the stopping of which is attended with much dissiculty; and, to effect which, an application of hot wax answers as well as any thing. Care should also be taken to keep the plants from the extremes of heat and cold for ten or twelve days after pruning, that the wounds may gradually heal, and the pores contract; otherwise they are apt to burst out afresh when the forcing is begun.

⁺ Let this be dressed to the old wood; passing it over, under, or between the fruit spurs.

In Autumn prune them down as follows: The uppermost shoot on the middle branch to eight, ten, or twelve feet, according to its strength; the undermost on said branch to two eyes; the strongest of the two uppermost on the side branches to sive or six feet; and the weakest, to three or sour; and the lowermost on each side branch, to two or three eyes each, which sinishes for the second year.

If all has gone well, the plants will be fit to produce a tolerable crop the third year; for which purpose there are now three ranges of shoots in height, and at the distance of thirty or thirty-six inches from each other; having short spurs of two or three eyes for the production of a succession of wood between them at bottom.

Train the uppermost shoot on the middle branch to the top of the house; the lowermost till it touches the bottom of faid shoot; rub off all the intermediate ones which have no clusters, and shorten those that have, at one joint above the uppermost cluster. Train that shoot which was left longest on the side branch. to the top of the house; the lowermost to the bottom of faid shoot; rub off what have not, and shorten those that have clusters, as above. Train that shoot which was left shortest on the side branch, to eight or ten feet; the lowermost to fix or eight eyes; and rub off or shorten the intermediate ones as above. Train the uppermost eye of each of the spurs on the side branches to five or fix feet; and the lowermost to as many joints. Thus will the trellis be compleatly filled with young wood to produce a full crop next feafon *. In Autumn prune down as follows: The uppermost on the middle branch to within eighteen
inches of the top of the house; the +lowermost to the
length of six feet; the uppermost shoot on the longest side branch, to within nine feet of the top of the
house; and the undermost to the length of eight or
nine feet; the uppermost shoot on the shortest sidebranch to within nine feet of the top of the house;
and the undermost to sive or six eyes; the longest
shoot from the spurs on the side branches, to three or
four feet; and the shortest to two eyes each, which
concludes the third year.

To the intelligent reader, it will be unnecessary to go through the operation of training and pruning for next season; I shall therefore conclude this Section after making a few necessary observations. It may not be convenient to follow the above directions in all cases; therefore much must be left to the judgment and candour of the gardener; but I would (in a general manner) caution him from any great deviation, and particularly from suffering too great a profusion of shoots and soliage in the Summer dressings. These, if the health and regularity of the plants is kept

Having made no distinction between the two kinds of Grape houses in the culture; I wish to be understood here as meaning the large house, the roof of which admits of four ranges of bearing shoots; whereas the back wall of the small house will admit of only three ranges.

[†] Next pruning season this must become the middle branch, by the lopping off of all above the bottom of it.

kept in view, will require to be repeated every five or fix days; and let not this be thought a hardship, for, from experimental practice, I can assure him, it is attended with more ease and less perplexity, than when the plants are suffered to grow wild as a bush. Therefore let all laterals, tendrils, and decayed leaves, be carefully removed as they appear; and when the fruit begins to colour, let at least one third of the whole foliage be regularly thinned away, which will greatly promote the swelling, and render the fruit of an infinitely higher slavour, by the free admission of the sun and air, than when shaded by the whole foliage, laterals, and tendrils, as is too frequently the case.

As there are a great variety in the kinds, not only in the fruit, but in the strength of the shoots and size of the leaves; respect must be had to the distance they are placed at accordingly, and also to the shortening of them, both in Summer and Winter dressings.

Pay respect to the regularity of the young shoots only, no matter how near they lie to, or even if they cover, cross, or are dressed to the old wood; which last let be cut away punctually when it has done its office.

And for an illustration of the Autumn or Winter prunings, see Fig. 3. Plate V.

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SECTION VI.

On the Temperature of the Grape House.

FIRE should not be lighted the first season, unless it proves cold or wet, and the wood is not ripened in good time; in which case, a moderate fire heat, from the first of September, would greatly encourage the growth, and promote the ripening of the wood.

As the plants will bear gentle forcing the third seafon, it will be adviseable (for that purpose) to forward them the second in a moderate degree.

For this purpose, let moderate fires be made about the first of April, (by which time the plants will begin to vegetate,) so as to raise the air of the house at six in the morning and eight at night to about 55°; in the course of a fortnight encrease it to 60°; and in another fortnight to 70 degrees; at which let it continue till the first or middle of June, and then be totally discontinued for the season.

The third feason, the forcing may commence on the first of March, without injuring the plants; and, if carefully performed, a fair crop of fruit may be obtained. Begin then by making and regulating the fires, so that the thermometer may not stand above 50 degrees at seven in the morning, and eight or nine at night; keep it so till every eye in the house is broke; and then gradually encrease it to 60, 65, 70 and, when the bloom begins to open, to 75 degrees. As I have already hinted in another part of this work, vegetation in forcing ought to be brought on as it were by stealth; which is the cause of my advising the above gradual and progressive rise in the climate of the house: and if this is not particularly attended to in the first stage of the operation, disappointments will follow, as the plants will not break their eyes (and of consequence not show fruit) regularly.

Keep the air of the house as near to 75 degrees, till the fruit is fairly set *, as possible; and it may then be let down to 70 or 72 degrees; at which endeavour to keep it, till the crop is all gathered; after which, no farther attention to the climate is necessary.

In the following season, the forcing may (if fancy requires) be begun a month or six weeks sooner; i.e. about the middle of January or sirst of February; in D 3 which

^{*} Grapes in general are found to set best in a most heat of about 75 degrees. But I have found by experience that all the kinds of frontinacs require a much greater degree of heat, not only when in flower, but from the time the clusters are distinguishable; while those of the white sweet water and white and royal muscadines, require a much less degree: the former being apt to curl up and become sterile for want of heat, and the latter to produce a greater quantity of small berries in consequence of too much. Wherefore, where there is any difference of climate (which is sometimes occasioned by the placing of the fire places) in the house, the above hint should be taken advantage of:

which early season great attention must be paid to the regulation of the fire heat. I believe I have been more scrupulous in this particular than most gardeners; some of whom I know laugh at the idea of too much uniformity in the climate, alledging no such strictness to be necessary, from the unsteadiness of our own: not considering the vast disparity between the unsettled state of the climate in our Island, and the regular serenity that prevails, at all times, on the Continent.

A month may be gained every season, (where there are two or three Grape houses; and it is required to have Grapes at a very early season;) until you begin to force the first so early as the first of October: but where there is but one or two houses, the first of March in the one case, and of January in the other, is quite soon enough.

SECTION VII.

On the Admission of Air to the Grape House.

AFTER planting, let a due portion of air be given every day from sun-rise to sun-set, until the buds begin to break; after which, observe a more punctual regulation, being guided much by the temperature of the weather, and the quantity of sun-shine, and admitting less or more every day, unless the severity of frosty winds renders it imprudent to do so. But, as the Summer advances, be very liberal in this article

article in serene weather: it will greatly tend to the strengthening of the young shoots.

It is a practice with many to uncover their Grape houses in Winter; this I never did, not so much that I disapprove of the practice, but owing to the expence attending it, not only in removing and puting on, but in breaking the glasses, and wasting the slues by the extremes of frost and blanching rains. But, my method is to admit an equal and free circulation of air, by opening the sasternately at top, bottom, and middle, to the extent of at least a third part of the whole covering, and letting them remain so day and night; never shuting up for any cause but that of two much wet.

The fecond feason, observe much the same regulation as above; and, if fire is applied for the forwarding of the wood, (as hinted in Section vi.) pay due attention at that time, as the sudden breaking out of the sun in dull weather, when there is a good deal of fire heat in the house, is attended with much danger.

On the supposition that the plants have made good wood for the production of a crop, and are to be forced from the first of March; let the house be shut up at night from the middle of February, and have the same quantity of air in the day it enjoyed all. Winter. From the time the fire is lighted, give a moderate quantity, every day if possible, till the buds have all broke, to the extent that in sun-shine the thermometer may not rise more than 10° above the fire-heat medium: but, after the buds have broke, and the temperature of the house is encreased, be careful in the admission of frosty, or foul damp air.

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The latter may be entirely excluded, except perhaps for an hour or two in the middle of the day, and the bad effects of the former, by opening the top fashes * only a little way, to pass off the rarified air occasioned by the sun heat, which is frequently very intense in clear frosty weather in the months of March and April.

In clear fun-shining weather, my mode of practice is, to give and take away air by degrees; that is, by giving half air about eight in the morning, full air about ten or eleven, reducing to half air about two or three, and shutting up about four or five in the afternoon, according to the season.

From the time the fruit begins to colour, give large portions of air till the crop is all gathered, the flavour being much augmented thereby; and afterwards expose the house night and day for the Winter, as directed above; shutting up, however, if much wet, or hard frost, should happen during the first ten or twelve days after the plants have been pruned for the Winter.

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^{*} Few people pay the attention to this article which, in my opinion, it deserves. I have often seen air admitted in a manner as if by mere chance; sometimes by opening two or three sasks at a place—and that sometimes in the middle of the house, the top, bottom, or either end, &c. &c. without the least discrimination. The air ought to circulate freely in all parts of the house. To effect which, it should be admitted at top, bottom, and middle, or at least at top and bottom; dividing it equally in every part of the house, according to the quantity to be given: and that too at all times; unless the severity of frost renders it imprudent to do so any where but at top, as here directed.

SECTION VIII.

On Watering, Washing, and Steaming the Grape House.

THE first and second seasons, keep the border in a moderately moist state while the plants are growing; but, after their growth begins to abate, (particularly the second season,) with-hold the waterings by degrees till it is quite stopt, in order to make them harden and ripen their shoots for the production of a crop the third year. Water frequently with the drainings of a dunghill.

Wash with the hand engine twice or thrice a-week in the evening, in order to refresh and keep the

plants clean. Steaming is unnecessary.

The third season, keep the border also in a moderately moist state till the fruit begin their last swelling. Give large quantities till they begin to colour: after which, entirely with-hold it till the crop is gathered; and then give two or three hearty waterings, to recover the state the border ought to remain in for the Winter.

Wash twice or thrice a-week till the flowers begin to open; with-hold till the fruit is fairly set; wash again till they begin to colour; and then with-hold entirely for the season.

In the interim of washing, steam every night when the fire is at the strongest, by pouring * water on the flues

^{*} In another part of this work I have already hinted, that I do not think it worth while to erect the steam aparatus for any

flues till you cannot see an object at the distance of two or three yards: and repeat this early in the morning, if the temperature of the house require the making of sires, or if there is a sufficient heat in the flues to produce it, even in a middling degree.

SECTION IX.

On the Formation, Thinning, and Maturation of the Clufters.

IN the vast variety of Grapes, it happens, that not only the berries, but the bunches, assume different forms: and although many kinds, from their nature, require little or no trouble, except thinning, in the formation of handsome clusters; yet, there are some which, from the looseness of their composition, require to have their shoulders supported from the body of the bunch, not only to promote the regular swelling, but to prevent the rotting of the berries, which otherwise frequently happens, if damp weather, in the time of ripening. Amongst these may be reckoned the Syrian, Tokay, Raison, Lombardy, Royal Muscadine, St. Peter's, and the Hamburgh; which, when

any species of forcing, except peaches. For the Grape house, it would be extravagant; as steam can be produced there at any period of forcing, especially in the slowering season, when a strong site heat is requisite at any rate. But, I prefer the application of water from the engine to steaming, at any time, except when the plants are in bloom; as thereby the soliage is not only resrethed, but kept clear of dust, insects, &c.

when the berries have arrived at the fize of peas, should have their shoulders supported to the trellis or branches by strands of matting, &c. and, at same time, have their berries regularly thinned out, with sharp narrow-pointed scissors, to the extent of about one third of the whole. At this time, also, let the other kinds be thinned out in the same manner; observing to thin out the small, seedless berries only, of the Sweet Water, Flame-coloured Tokay, and Muscadine.

After the berries begin their last swelling, and approach to maturity; care must be taken to keep the bunch clear of any which, from damp, bruises, or the bites of wasps, or any other insects, may begin to mould, as thereby the whole cluster will be quickly affected and entirely spoiled.

Grapes of all kinds should hang on the tree till dead ripe, particularly the thick-skinned ones.

SECTION X.

On the Infects which infeft the Grape House; and how to destroy them.

THESE are, the green fly, thrips *, red spider, and wasp.

The two first are easily destroyed by a sumigation

^{*} Frontinacs are more subject to the red spider than most other forts; and all kinds are more so in the pine or dry stove; than in the Grape bouse.

of tobacco. The third are kept under by the engine in Summer; and effectually destroyed, as directed in page 35, in Winter. The last, by the destruction of their nests, phials filled with honey and water, or sugar and small beer, and bird-lime. All these methods are, however, sometimes inessectual for the destruction of wasps where they abound in vast quantity: and their sondness for Grapes renders it sometimes necessary to inclose the branches in bags of gauze, or silken paper, which is truely a missortune; as the Grapes, by being so much excluded from the action of the sun and air, fall greatly off in slavour.

11 201 201 10 SECTION XI.

morely as thursby the whole differ will be quickly

bunch clear of any which, from damp, bruiles,

On the Prolongation of the Grape Season, where there are more than one Compartment for its Culture.

WHERE there are two or three Grape houses, and a succession and fruiting pine stove, the Grape season may be continued from the first or middle of March to Christmas; and where there are two or three Grape houses only, from the first of June in the one case, and the middle of April or first of May in the other: to essect which, the following methods are according to my mode of practice. For the production of ripe Grapes in March *, I reversed

my

^{*} I have sometimes had them in the end of February.

my fuccession and fruiting stoves *; by which means, I had it in my power to force, in some degree, the vines therein contained: as I found, without doing fo, I could not bring them in before April or May t. In this manner, (and from the way in which the plants were trained,) the two stoves supplied a constant succession of fruit till the first or middle of June. To continue which, I began my first Grape house on new-year's day; my second on the first of March; and my third, and last, I kept as much back as possible, by exposing it to the weather night and day till the natural feafon brought them into flower, (or nearly so). By this time, it was the first of June. I then shut up at nights; and encouraged the growth of the plants and fruit, by lighting and continuing the fires the whole feafon; had ripe fruit about the first of October, which (by part being hung up in the fruit room) continued till Christmas.

Previous to my introducing Grapes into the pine stoves; and to have a supply of fruit from the month of April to Christmas; I began to form my first house on the first of November, my second on the first of February, and my third I treated in the manner above specified.

The following season, I began the first house on the first of October; and cut grapes on the last day of March: but, in the night between that and the first

^{*} They were both on one plan.

⁺ A more constant equality of climate being requisite in the stove, than in the Grape house, is obviously the cause.

dent was lost the whole foliage, wood, and about five hundred bunches of Grapes just coming to maturity. Nothing could be more galling. I instantly cut down every new shoot to one eye; continued the same degree of heat; and gave plenty of air and large quantities of water. The plants made the finest wood that same season; and had the best crop of fruit the following I ever saw.

The above curious circumstance I have related, not merely on its own account; but to the end that, were the like happening to any person, the plants might not be thrown out in despair; which had well nigh been the case with these. I also planted young plants between each of them; but, as the old ones far surpassed them in vigour before the end of the seafon, I threw them out again.

Let it be here observed, that although I found it necessary to force the Vines in the stoves alternately, by reversing them from fruiting to succession houses, yet I by no means did, or would advise that to be done, with the Grape houses. Forcing of any kind is an outrage done to Nature; and the more it is avoided, the greater will be the success; and consequently, the same rotation being observed, will be the less liable to error.

SECTION XII.

On the Cultivation of Grapes in the Pine Stove.

THE cultivation of Grapes in the Pine stove is in general practice; and the plants are generally planted on the out-side of the house, introduced through holes in the parapet, and trained up the under-sides of the rafters.

This method I have prefumed to deviate from, for the following reasons: First, Because I think it unnatural that one part of a plant should be, as it were, in Greenland, and the other in the West Indies; and, Secondly, Because I am convinced that no plant (espicially the Pine) will live and thrive as well under the shade of another, as when exposed to the free fun and air. To obviate these objections, I planted my Vines in the lobbies between the stoves and peach and Grape houses; introduced them through the partitions; and trained them horizontally on trellifes fixed against the back walls and upright fashes in front, (See Fig. 2. Plate I.) By which means, I rendered each of the stoves as good as any Grape house, without being in the least injurious to the Pines.

The front walls of the lobbies * were also built on pillars; and a border, both without and within, prepared

^{*} This method may be practifed in the same manner, where a Grape or peach house adjoins the stove; and where a stove stands

prepared for the plants, in the same manner as for the Grape house.

The second year after introduction into the stove, the plants compleatly filled the whole trellis; and a fine crop, the third year, gave a lustre and richness to the house (in conjunction with a good crop of

Pines) highly gratifying.

The same methods, in regard of watering, washing, and steaming, is to be practifed here as in the Grape house. Air is admitted folely for the fake, and to answer the nature, of the pines: the temperature of the house is also regulated for their sakes. the mode of training and pruning is very different from that in the Grape house. Here, you have it not in your power to bring on vegetation in that flow and regular manner as in the Grape house; and, confequently, were the shoots to be laid in at as great lengths, they would only break perhaps a few eyes at the extremities, and the rest would remain naked. This I found, from experience, to be the case; although it did not happen for the first three or four years, owing to the youth and vigour of the plants; but, when they had exhausted themselves a little by bearing a few crops, they began to break their buds in the manner above stated. I therefore made it a practice to train them only to five or fix feet in Summer, and shorten them down to one or two in the pruning

stands detached, it is customary, and indeed necessary, to build porches with double doors; and, of consequence, it is easy to render them subservient to this purpose.

pruning feafon; by which they generally broke all their eyes, and produced plenty of fruit.

In one house I tried, for two seasons, to produce crops by laterals; but found that method attended with more inconveniency than the above, from the difficulty of procuring a proper succession of strong shoots to produce the laterals, without which they bear very infignificant clusters.

I also, in the other house, produced a second crop, for two seasons: but, sinding it to exhaust the plants very much, I discontinued it; the more especially, as, having so many compartments for Grapes, the practice of it was the less necessary. The method is this: Just about the time the fruit is half ripe, and when the under part of the shoot is also ripe to the length of about two or three seet, and the extremity of it in a growing state, shorten it at about two or three seet above the ripe part. It will push again, and will generally bring two clusters. Sometimes, also, the second and third eye will push, and bring a cluster or two. In winter pruning, shorten down the first, or spring-made part of the shoot, to two or three feet.

This method may be repeated with pretty good fuccess once in two or three years; but, if done every year, it will (in the course of three or four years) occasion the cutting of the plants down to the ground, in order to make them put forth a fresh stock of wood.

In the event of severe frost, and the plants being in an early state of vegetation; let the border, on the out-side, be covered with a quantity of stable dung,

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or long litter, to prevent the roots from being injured by the weather.

Unless you wish the plants to produce a second crop, they must not be pruned for good sooner than October; and, at same time, that operation should not be deserred longer than the first of November, lest, when they begin to vegetate, they should bleed.

Grafting the Vine is performed with great facility; but I do not think it of such consequence any where as in the stove. The method by approach * is certainly to be preferred. The frontinacs, muscadines, and sweet-waters, would be greatly improved, and rendered more durable for this compartment, by being engrasted on the Syrian, or any of the other coarse growing kinds: but the Syrian is the most proper for a stock, of any.

Grape Vines will bear forcing, and last for many years, if under judicious management: but it frequently happens (especially where the gardener is often changed) that the plants run out of a proper stock of bearing wood, either for want of keeping

^{*} The common way of performing this method, is, by growing the young plants in a pot, and engrafting the last Summer's shoot, on the old stock, just about twenty days before the plant begins to vegetate. But, the most successful way is, to perform this operation about the time the fruit begins to ripen, in the following manner: Apply the middle of a young shoot, whose bottom part is beginning to ripen, and the extremity in a free, growing state, to the last year's wood on the stock; bind up with strands of matting; and apply no clay. The young plant will be perfectly secure, before the growth is over, the same season.

the border in a proper condition in respect of trenching and manuring, or by being irregularly and untimeously forced. To recover which, the plants should be cut down to the last eye of the three lowest shoots of the former year upon each; the roots cut to within a yard of the stem on each side; and the border trenched up, and, if necessary, renewed, and rendered equal to a new one.

The plants will make vigorous roots and branches; and the third year after will be as good in all respects as they were in that of their age.

This is not theory; I have been eye-witness to the experiment.

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CHAPTER

CHAPTER V.

There is not been reported in release

MELONS.

THE cultivation of this much esteemed fruit is so general, that hardly a garden is to be met with where it is not followed in a greater or less degree, and that too with general success. As I have been pretty particular on the forcing of cucumbers, as the treatment of these and Melons is in many respects the same, and as I have said much on the culture of the cucumber, which equally applies to that of the Melon; it will be unnecessary to go through an elaborate repetition here. I shall therefore briefly remark any particular difference in their management on the dung hot bed, and then pass to the culture of Melons in slued pits.

Let the plants be raised in the same (or a similar) seed-bed as that of the cucumber; the bed or beds wherein they are to come to maturity, be made in the same manner, and a little stronger, tursed all over, the same quantity of old tan or light sandy loam laid on *, moulded and planted in the same manner,

^{*} One half strong brown loam, a quarter light black loam, an eight vegetable mould, and an eight stable dung, will make

manner, have air admitted freely, and kept moderately moist till they begin to shew fruit. After this, and till the fruit is fairly set and begun to swell, be sparing in the waterings, (especially if damp weather,) and also endeavour to keep the bed as free of steam as possible; shorten the vines which have fruit at two joints above it, and train those that have none, in a regular manner, to the length of seven or eight, and then stop them, to make them put forth new vines, which will generally show fruit at the second or third joint.

When the fruit is fairly fet, water freely till they have done swelling and begin to ripen, and then be very sparing, as too much water at this time not only takes greatly from the flavour, but frequently occasions the bursting of the fruit, which renders them both unfightly and unfit for carriage. Let a piece of flate, tyle, or glass, be laid under each fruit; it both keeps them from damping and partaking of an earthy flavour. Some indeed flate the furface all over, and others cover with straw, reeds, moss, &c. all which I disapprove of. The slates being so near the glass, draw too strong a reflection in hot weather for the plants to bear; and the straw, moss, &c. contain, and confine too much damp in dull weather; besides, the flates contribute much to the breeding of the redspider*, and the moss, &c. to the harbouring of beetles,

an excellent compost for melons; of which quality is that which I have used for many years.

^{*} Melons are very subject to this destructive insect in hot weather,

beetles, ear-wigs, &c. which are very destructive of the plants and fruit.

As the fruit approach to maturity, keep the plants moderately thin of leaves, none of which suffer to shade the fruit from the sun, and give large portions of air, which will add much to their flavour.

Melons should be kept regularly and moderately thin of vines and foliage at all times, should be frequently looked over, and never pruned too much at a time, as thereby the plants exhaust themselves much, being apt to bleed at every bruise or incision.

Melons should be cut the moment they are ripe, otherwise they lose much of their flavour; this, in most kinds, is better known by the smell than colour of the fruit.

Many of the early kinds, and if early fown, will produce a second crop, equal, both in quantity and quality to the first. For this purpose, after the first crop is all cut, the Vines should be shortened back to the last live-joint on each, the bed well-watered, and shaded from the mid-day sun for eight or ten days; by which time the plants will begin to push and show fruit in abundance. This may also be obtained by layers; they will also produce very well by cuttings.

Melon

weather, which is truly a calamity, as nothing will stop its progress but water, which at some periods of the Melon season cannot be applied without doing much injury to the fruit; and the leaves and vines being of so brittle a nature, they cannot be brushed or handled (although ever so carefully) without sustaining less or more injury. The liquor, See page 34, is effectually destructive of it, but must not be applied to soliage of any kind.

Melon feed ought to be perfectly ripened before fowing, by being kept in a very dry place, or worn in the pocket; but it is fafest not to sow it till a year old, and it will keep fresh for seven or eight. If the seed is not perfectly ripened, and saved from fruit which is also so, the plants produced by it will not be fruitful, running much to vines and male-bloom; and any fruit which may be shown are apt to drop away.

I come now to the culture of Melons in flued pits. (See Fig. 1. Plate I.) I have already faid, that I do not think these pits so eligible for the production of Melons at an early season, as the dung hot-bed, and in page 12 have given my reasons. I shall therefore suppose that the pit is built for other purposes, is employed in the spring in forcing asparagus, &c. and is to be employed in producing a late crop of Melons.

The first or middle of June will be soon enough to plant*; and at that season a very moderate degree of bottom heat will be sufficient; whatever articles the pit previously produced will also have been forced on tan or dung, which will also be now much exhausted. Let the heat therefore be renewed, by adding and mixing about one third of new, with the old tan or dung; level it to the bottom of the slues all around; tursing will be unnecessary; mould to the depth of sifteen inches, which will raise the whole surface to the height of the top of the slues; and by

* The plants may be raised in a hot-bed, or under hand or bell-glasses.

the tan or dung subsiding, will again be level with their bottoms before fire heat is necessary. Place the plants in a row along the middle of the pit, at the distance of two feet from each other; and attend to them in the articles of water, air, pruning, impregnating, &c. in all respects as directed for the dung hot-bed, and according to the season and state of the weather, till the first or middle of September; and by that time it will generally be necessary to apply fire heat, both on account of cold, and damp, which then begin to be considerable.

The fruit by this time will be far advanced, some of which will be approaching to maturity; and for the maturation and production of the rest in a tolerable degree of perfection and slavour, let slow fires be made in the evenings, encreasing as the season advances, so as to raise the air of the pit at eight at night, and eight in the morning to about 70 degrees.

Air is effential to the flavour of the fruit; and to enable you to admit it in tolerable quantity, and at fame time keep up the heat in dull weather, let a little fire be made in the mornings. Water must be used with caution; the growth of the plants will now be over; and when the fruit hath arrived to its full size, it should be entirely discontinued.

CHAPTER

CHAPTER VI.

MUSHROOMS.

SECTION L

On the Construction of the Mushroom House.

lies at all times of the year; and some have compartments built solely for its production; but it is generally produced in the back sheds of hot-houses or green-houses, cellars, ends of stables, &c. and sometimes on beds built in the open air, and protected by coverings of straw or other litter. This last is attended with much inconvience, not only on account of the difficulty of effectually sheltering the bed from the inclemency of the weather in Winter, but that in covering and uncovering at the time of gathering the crop, many of the young ones which are just peeping through the surface are unavoidably destroyed.

Little light or air (except when the bed is in preparation) being effential to the production of mushrooms, they may be raised as successfully in the backshed, shed, stable, or cellar, as any way; but where they are required at all times of the year, a compartment where fire heat may be commanded is indispensibly necessary. Fig. 2. Plate IV. represents the plan of a mushroom house, wrought by one fire, and divided for the purpose of producing them in succession, on a construction that has given the greatest satisfaction for many years. It is of little consequence in what situation it is placed, providing it be dry, and the roof

may either be of flate, tyle, or thatch.

Where there is neither shed nor stable, &c. rather than make up the bed in the open air, and be under the inconvenient necessity of covering the surface with straw, &c. let a frame in form of the roof of a house composed of half inch boards, be made to any convenient length, and the width of fix feet at bottom: this two people can lift off and on at pleasure; and in the feverity of Winter it can be covered with litter, &c. to prevent the frost from destroying the plants or fpawn. The boards should be imbricated, and well painted or laid over with pitch, to prevent the wet from penetrating: and a trench should also be dug all round the bed to keep its bottom dry. Boards should also be made, at two or three different places, to flip for the admission of air when required.

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SECTION IL

On Preparing the Mushroom Beds.

A CCORDING to my practice, the production of the Mushroom depends almost solely on the preparation of the bed. Some pay little attention to this matter; and where spawning is uniformly practised, the less is necessary; but I prefer the method of making the bed a whole mass of spawn.

It may be objected that this method is dilatory; this I grant is the case; but if the bed is duly prepared, the day on which you are to cut may be reckoned upon with equal, if not greater certainty, although at a greater distance; and of what consequence is that? it only requires beginning the fooner to prepare the bed. Beds that are built and spawned in the common way feldom produce above three or four months together; I have frequently had them producing the year round in great abundance; and I once had a bed which produced two compleat years, and in fuch quantities, that besides generally yielding a dish every day, several gallons of ketchup was made from it. However, Mushroom beds of all kinds are subject to many misfortunes, and the spawn is of fo delicate a nature, that it is quickly destroyed by too much cold, heat, drought, or wet. My mode of preparing the bed is this: I first lay about a foot of furnace ashes, brick batts, or stone chips for a bot-

tom, then fix inches of * horfe-droppings, taken carefully from the stable every morning, and kept as whole as possible; these I suffer not in any wise to heat; and the whole time the bed is in preparation, I expose it to all the air in my power, providing it is perfectly dry. After this course has lien ten or twelve days, is quite dry, and there is no apprehenfion of its fermenting, let it be covered to the thickness of two inches, with half vegetable mould of decayed tree leaves, and half light fandy loam, which should be well mixed together previously. Lay on another course of droppings as above; and when it is also perfectly dry and past fermentation, cover it with the same mould as above. Lay a third course of droppings and mould in the same manner, which finishes the bed. In the making, it should be gently rounded in the middle (especially if out of doors) to run off the wet. Thus the bed will generally be a month or five weeks in making, and in as much more will begin to produce, unless the weather or state of the droppings has been unfavourable.

It is obvious, that from the above mode of proceeding, a whole course of droppings cannot be laid on at once, unless there are a vast many horses, or the bed is of trisling dimensions; therefore when the last

^{*} I find that the richer the feeding of the animal, the more productive are their droppings; and therefore prefer the droppings of coach or hunting horses to those of the farm. It may be worthy of notice, that stone-horse droppings are by far the most productive of any.

end of the bed is covered, proceed with the first (if fit) a second time, &c. covering with mould as you go on.

SECTION III.

On the Temperature of the Mushroom House.

IT must here be understood of such as is represented by Fig. 2. Plate IV. or of one where fire heat is requisite, and at command. I find that Mushrooms produce best in a constant heat of about 55 degrees; and the more regular it is kept the greater will be the success. Air is of little importance, unless to dry off damp.

SECTION IV.

On Watering the Mushroom Beds.

THIS must at all times be moderately and regularly performed; but it will generally be unnecessary before the bed begins to produce, as the moisture of the droppings is usually sufficient till that time. Let it be cautiously performed at first, until the bed attain to a proper consistency, and then with a little more freedom. As much as will fairly wet the surface, once in three days, will generally be found to be sufficient-

SECTION

SECTION V.

On the Prolongation of the Mushroom Season.

In most places the open fields supply them for two or three months in Summer; yet in very wet seasons they are rarely to be found if the soil be not of a dry nature; therefore, where there are two or three places for their production, and where they are in great request at all times, it might be advisable to have little dependence on the fields, reserving the produce of these for ketchup, and preparing beds in constant succession to supply the ketchen. For this purpose, the compartment where fire heat is at command, should always be appropriated to the Winter beds, and the sheds, &c. to the summer.

In gathering the crop, care should be taken not to pull up or disturb the roots of those you cut, as there are generally many young ones adhering to, or rising about them. Mushrooms also frequently form, come to maturity, and die away entirely under ground in these beds, if suffered; but they are easily recognised, as they are generally very large and push up little hills like those of moles above their heads. Discovering and cutting them should be performed with care, that the spawn may not be injured.

CHAPTER

CHAPTER VII.

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PEACHES AND NECTARINES.

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SECTION I.

On the Construction of the Peach House.

HE construction of the compartments for L forcing this much admired and justly esteemed fruit, vary yet more than that of the grape house; and what I have advanced in the first Section of the Chapter on Grapes, will equally apply here. But there are some kinds of compartments for the cultivation of peaches in use, which I disapprove of, and would wish to point out. These are, oiled paper frames, and frames placed against flued walls, without front flues. I object to the first, on account of its darkness, and incapability of admitting the rays of light, and free air; both of which are so indispenfably necessary to the health and vigour of the trees: -to the fecond, because the front is the most valuable flue in any house; both on account of the saving of fuel from the circumstance of its having a greater command

command on the temperature, (all rarified air ascending,) and on account of the injury done the trees by the violent heat of the back flues in keeping up the temperature in stormy weather; besides, the propensity of insects to harbour and breed between the trellis and slue in these circumstances.

Fig. 2. Plate II. represents the plan of an approved Peach house, wrought by one fire, which communicates first with the front flue, and then has two returns in the back wall; and, in my opinion, is best adapted of any to early forcing. The strength of the fire is exhausted in the front, and, by the time it returns to the back flues, is of a slow, mild nature; from which no apprehension of danger need be entertained, even at a very early season.

Fig. 1. Plate III. is also on a construction that is perfectly adapted to the cultivation of Peaches. But, as this plan is given purposely for grapes, it may be necessary to remark, that the two sires are capable of working to an extent of ten seet more in length, if for a Peach house; and also, that, as the border for the Peach house is to be only three seet deep, it will be unnecessary to found the pillars, which support the front wall and slues, any deeper than three seet and a half.

In a house of this kind, a trellis is to be fixed against the roof beams or rafters, to the extent of half their height; trees planted between the front slue and wall, and trained thereto. These will in nowise shade those on the back. And thus will one house be rendered nearly as good as two, as the trees on the front will have a run of eleven or twelve feet.

There

There is a Peach house of this fort at Wemys Castle, and two at Raith, which have given great satisfaction for many years.

SECTION IL

On the Situation and Preparation of the Border.

vation of the grape, in regard to the fituation of the border, equally applies here, both in refpect to the good and the bad; a repetition of which is unnecessary. I shall therefore pass to the composition, breadth, and depth. Three fourths strong brown loam, an eighth light sandy loam, and an eighth stable dung, with about a fortieth part of shell marle, is the composition of the borders at Wemys Castle; all of which are compleatly three feet deep. The breadth for the narrow houses, is fourteen feet from the back wall; and, for the wide one, all the width of the house within, and to the extent of twelve feet without.

For particulars, respecting the annual management of the surface, &c. &c. see the latter part of the second Section on the Grape.

SECTION III.

On Planting, and the Kinds best adapted to, the Peach House:

AIDEN, or one-year-trained trees, are to be preferred to any other. Riders of the same age should be planted between the dwarfs; except on the front of the large house, where they would not have time to do any good till their removal would be necessary. From twelve to sisteen seet, according as the house will best divide, is a competent distance between the dwarfs. The season is, any time from the first of November to the first of March. Fill in the pits with light compost, and settle with a little water.

The following is a list of Peaches and Nectarines; out of which, those marked thus * ought to be preferred.

Peaches.

Peaches. Peaches. Mignionette. * Early Purple. * Red Magdalen. * Late do. * White do. * Orange +. * Royal George. Ramboulliet. * Hative. * Grimwood's do. * Noblesse. Nectarines. Chancellor. * Roman. Belle Cheveraux. * French Minion. * Scarlet. Early Newington. * Elruge. Smith's do. * Newington. * Montaubon. * Temple.

F 2

Tetton de Venus.

SECTION

* Duc de Tello ‡.

† This fruit, when ripe, is the most elegant of any of the Peach kind; is a great bearer, a cling-stone, and of these the best slavoured I know. There is one tree of it at Wemyss Castle; which, I presume, is the only one in this country.

† This is a Spanish Nectarine; and, of all others, ought to take preference. There is a tree at Wemys Castle; which is also the only one in this country. The fruit is of the most exquisite flavour, dark purple, a free-stone; and grows to the size of a noblesse Peach in the same house with it. The tree is the most healthy and beautiful of any I ever saw; and bears large and regular crops.

SECTION IV.

On Training * and Pruning.

FAN-training is the only way in which Peaches will do well. Therefore, after planting, and to make the trees put forth vigorously and fill the trellis from the bottom, (I speak of the dwarfs,) head them down to two or three eyes on each shoot, if maiden, and to the last eye on each branch, if one-year-trained trees.

The riders, being temporary, and placed here only for the purpose of obtaining a crop or two while the principals are filling their spaces, need not be short-ened so much, whether maiden or trained trees. This will make them put forth more moderate shoots, and bring them sooner into a bearing state; which object must always be kept in view while they remain here. And, as the treatment of them will, in all other respects,

* Much has been said, of late, respecting training on horizontal trellises; and some have even been at the trouble of erecking them in a manner whereby (by the use of ropes and pullies) they can depress or elevate them at pleasure. This, I confess, is both minute and reasonable, where it can be practised. But I am inclined to think that it cannot easily be done without straining the tree in the movement; and it is obvious that it cannot be done by any but a small trellis placed in the middle of the house. After all, the production of well flavoured fruit depends much more on the judicious management throughout, than on what position the trellis be. spects, be the same as that of the principals, I shall take no farther notice of them; leaving the thinning away, and final expulsion of them, to the prudence of the gardener.

When the shoots have arrived to the length of two or three inches, rub off such as are placed fore-right or back-right, and lay in the others as they advance, at the distance of nine or ten inches; being careful in not bundling in the leaves with the tie, and allowing sufficient room for the swelling of the shoot: and pinch off all laterals as they appear. When their growth is stopt for the season, cut them back from half to a third of their lengths, according to their strength; and, in dressing, bear the side ones well down, to fill the bottom part of the trellis.

Next feason they will push vigorously, and must be laid in at the above distances; observing to lay in the undermost shoot on each branch to surnish the under part of the tree, and the uppermost for a leader: rubbing off all the intermediate ones, unless wanted; but at any rate the fore-right ones, as these greatly deform the tree. At the end of the season, leave them generally at three sourths of their whole length.

If the wood has been well ripened this season, they will bear a few fruit the following. But, unless the trees are very vigorous, a very sew only should be suffered; paying respect rather to the furnishing of the trellis for a crop the fourth season, which may reasonably be expected.

For this purpose, lay in the summer shoots regularly, at the distance of six inches, which forthwit

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must be the medium; and, in the winter pruning, shorten the shoots of the extremity of the tree only a few inches each, and lay in those of the middle at full length. Observe this practice till the trees have silled their places; and afterwards shorten none, unless to fill any casual vacancy, or in case of the extremities of the shoots being injured by bruises, &c.

Peach trees require to be frequently looked over in Summer; and divested of laterals, and water shoots from the old wood, where not requisite; being kept regularly thin, and neatly dressed to the trellis, &c. In tying, however, be careful not to tie too near the point of the shoot; leaving always a few joints between the last tie and extremity; also be careful not to bundle in the leaves with the tie.

About the time the fruit is fairly set, is that for disbudding; and this operation is to be performed with great care and nicety. Select what buds on each shoot you think necessary to leave, and rub off the rest with the singer. Those to be left are generally the uppermost and undermost, and sometimes one or two about the middle of the shoot; which last should be left in an alternate manner. A wood bud is frequently placed by the side of, or between two fruit; in displacing of which, be careful in not injuring them.

When the fruit begins their last swelling, let them be exposed to the free action of the sun and air, by picking off every leaf that overhangs them.

SECTION

SECTION V.

On the Temperature of the Peach House.

TIRE heat should not be applied sooner than the third feafon; and then only to ripen the wood, in the Autumn, (if necessary,) for the better production of a crop the fourth. But as, even the fourth feafon, the trees will bear but very gentle forcing, and as I wish to be particular on this head; I shall wave the farther confideration of the temperature of the house to the fifth season, and shall then suppose the forcing is to begin on the first of February. Let the fire be made fo moderate the first fortnight, that the thermometer may not stand, at eight at night and seven in the morning, above 45°; and, in the course of the fecond fortnight, encrease to 50°; afterwards gradually to 55°; at which point endeavour to keep it till the stoning is fairly over, and then encrease to 60°; and, towards the fruit's ripening, to 65°; which it should never pass, on account of drawing the young shoots up weak.

In the whole progress of the application of fire heat, the greatest regularity and steadiness should be obferved; as these trees are impatient of sudden checks of any kind, especially in the time of setting and stoning.

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SECTION

SECTION VI.

On the Admission of Air to the Peach House.

ROM the time the trees are planted, a large and free circulation should be encouraged every day, from sun-rise to sun-set, the whole of the first seafon; and, when the growth is stopt, and the wood ripe, let the house be exposed in the same manner as directed for the grapes, in the Section on air, page 55. The fecond feafon, the house may be shut up at night from the first of March, and afterwards treated as above; and fo of the following. I come now to the fifth, or feason of forcing. Let the house be shut up at night from the middle of January, and enjoy a large and free circulation through the day till the first of February; after which, in a more moderate degree, according to the weather, and paying respect to the temperature of the house, till the bloom begins to open. After this, less or more must be admitted every day, if possible; as the setting of the fruit in a kindly manner depends much on wholesome air and a free circulation. In sun-shine, let it be admitted at this time to the extent that the thermometer may not stand at more than five or fix degrees above the fireheat medium; and at no time, till the stoning is over, above ten degrees; and afterwards, in the middle of the day, it may be suffered to rise to the height of When the fruit begins to colour, the house should be opened by sun-rise, and not shut till sun-set, unless unless to defend the fruit from heavy rains; paying no respect to sun-shine at this time: air being as essential to the slavour of the fruit as the rays of the sun, and the more so when these are excluded.

After the crop is all gathered, let the house be ex-

SECTION VII.

On Watering, Washing, and Steaming the Peach House,

PEACHES, when in a growing state, require plentiful waterings; and the border should always be kept in a moist state: with-holding a little in the time of setting and stoning, and totally from the time the fruit begins to colour. After the crop is gathered, give a few hearty waterings, to bring the border into a proper state for the Winter.

Wash thrice a-week, from the commencement of the forcing, till the flowers begin to open; with-hold till the petals begin to decay; wash again till the fruit begins to ripen; and then finally with-hold, unless the trees are afflicted with the red spider, &c. in which case, wash every day till they are quite clean.

In the interval of washing, steam night and morning, in the manner as directed for the grape house, if you are not provided with the steaming apparatus.

In another part of this work I have faid, that I do not think it of any confequence, except in the Peach house. My reasons are these—In the grape or pine house

house there is always a command of fire-heat, at any period of the feafon, to raife a fufficiency of steam for their purposes. But, in the Peach house, this is not the case: as, in mild weather, and in the flowering season, the temperature of the house is such, as sometimes to require very flow fires; and, of course, the flue is perhaps not heated enough to raise steam in any great quantity. It may justly be faid, that, in this case, it is the less requisite, as then the artificial air of the house approaches nearer to the natural: yet steaming, at this time, is of infinite benefit to the trees, as it both encourages the fetting of the fruit, and prevents the breeding of insects; and the engine cannot be employed at this time, for fear of hurting the bloom. Therefore, where there is a range of Peach houses, it would be advisable to erect the apparatus: but, for a fingle one, or two, I hardly think it worth the expence; as, in the case of steaming being impracticable, water can be thrown out of a very fmall squirt in the form of dew against the bloom. The idea of steaming every day without discrimination is, in my opinion, ridiculous. Is the world enveloped in a cloud of mist day by day? Does the health of either animal or plant require it? or, Could they bear it?

SECTION

as deal views, and, in conformity thereto.

ade a pendice to pull my Peache

SECTION VIII.

On Thinning and Gathering the Fruit.

THINNING is an indispensable duty; as there are many kinds of Peaches and Nectarines which otherwise would soon bear themselves to death. This operation, however, should be performed with caution, and never done for good till after the stoning is over; as, till then, all danger of dropping is not past. My rule for final thinning is this—A fruit for every foot square of the surface of the tree for the large kinds, and for every nine or ten inches of the small kinds of Peaches, and Nectarines in general. This must be understood as for trees in a healthy and vigorous state; but, when otherwise, they should only be suffered to produce accordingly. As an instance—I once had an Elruge Nectarine (a great bearer) which had a tendency to grow naked below; I pulled off every fruit within fix or eight feet of the ground one feafon, and it made excellent wood in that part in consequence. So that, it would appear, it were best to be contented with a fair crop; which is better, in the end, both for the tree and its owner.

It is customary to let the fruit drop of its own accord, when ripe; and, for this purpose, the border is covered with moss, and nets or mats are hung against the trellis to catch them, I have ever been of opinion, that all kinds of fruit, except grapes, lose much of their flavour if suffered to remain on

the plant till dead ripe; and, in conformity thereto, have always made it a practice to pull my Peaches and Nectarines. I have often been asked, how I came to know when they were fit for pulling? (as handling or feeling them is improper.) This is only attained to by minute observation and custom, and a thorough acquaintance of the kinds; and, if taking them gently between two fingers, (the back of the hand to the tree,) and moving them backwards and forwards, does not displace those I suspect to be ripe, I pass by them till next day. I go over the whole trellis every morning in this manner, and have found my account in the practice; as not the one half are lost or bruised, which are when suffered to fall; and the fruit, not being dead ripe, are much fitter for carriage, if requifite. This practice I would recommend also, on account that the border, being covered with moss, emits a bad flavour; and nothing is more conducive to a good one, than the furface being kept clean, and frequently stirred up while the fruit are ripening.

SECTION IX.

On the Infects that infest the Peach House, and how to destroy them.

THESE are, the aphis, acarus, and cocci, or fealy infect; to which may be added, although not an infect, that more deadly malady, the mildew.

In treating of this article in the third and fourth Chapters of this work, I have given ample directions for the suppression and extirpation of the infects; but the mildew remains to be confidered. It is evidently an itch or fcurvy in the blood of the tree; occasioned by injudicious management in the culture, a damp fituation, or cankering foil. And although I cannot fay that I ever had it in my power to try experiments for its destruction, (having never been troubled with it;) yet I have always endeavoured, and I think successfully, to prevent its appearance, and that by preparing good and kindly foil for the trees, and paying all due attention to their health and cleanlinefs. I am also confident that the washing with the liquor (See page 35) has much tended to its fuppression. But, after all, if the border is not compofed of proper materials, and rendered perfectly dry and comfortable in the preparation, much fear of its appearance may reasonably be entertained.

SECTION X.

On the Prolongation of the Peach Season, where there are more than one Compartment for its Culture:

HERE there are two Peach houses, and a sew trees planted against the open wall in a south aspect, the season may be prolonged from the first or middle of June, to the first of November in constant succession, by beginning to force the first house on the

the first of February, and the second about the middle or latter end of March. But where there are three or four * houses, and a flued wall, the season may be successively prolonged from the first of May to the first or middle of November. My mode was this; I began to force my first house on the first of December, and as it was not much to be depended on at that early season, my second on the first of January; my third on the first of March; and the fourth, I let come of its own accord without the aid of any fire heat. I never applied fire to the flued wall until the first or middle of August, and that in order to ripen the wood, and hasten the maturity of the late fruit.

I never reversed the successive order of the Peach houses, by which means they were always ready to vegetate at the same time of year on the application of fire heat, much less to their detriment, than if changed, in my opinion.

I would here observe, that Peach trees, if forced every year, will wear out in the course of twelve or fourteen; and, therefore, about the eighth or tenth year, young dwarfs should be planted where the riders stood, and the old dwarfs should be converted into riders by degrees as the young ones advance.

SECTION

At Wemyss Castle there are three narrow houses, a large double house, and an extensive flued wall, for which there are canvas screens; also a few trees on the common wall.

SECTION XI.

On the Cultivation of Peaches and Nectarines on Flued Walls, with Canvas Screens, Nets, &c.

It may be faid that flued walls are effential to the production of Peaches and Nectarines in the open air in this country, although there are fome spots, and in some situations, where good crops in some seafons are obtained without them; but to their production to a certainty, year by year, slued walls are indispensibly necessary; and where a sine garden is building, the extra expence in slueing two or three hundred seet of the best exposed walls, will be found but trisling. And if built according to the design, (See Fig. 1. Plate IV.) and wrought according to my method as under, the annual expence will also be trisling.

For fecuring the crop in the Spring, by defending the bloom till fairly set, from the frosty winds which so frequently happen at that season in this country, canvas screens or old nets are necessary; but the canvas is far preferable, and in the end, little more expensive than the nets.—There is a kind of thin canvas called Scrim or Osnaburgh, which answers very well, and is sold at about nine pence per square vard.

But for the flued wall at Wemyss Castle, I had

canvas wove on purpose, much thinner than any other I have seen, which now (by the action of the weather) is rendered as fine as gauze in comparison; and, which, seven years ago, cost but eight pence a yard. As much as covers a wall two hundred seet long and sourteen high, cost only about sisteen guineas, including spars, cords, and pullies; and all these, the cords excepted, are as good this day as that in which they were made.

The manner in which it is applied is this: The canvas is made into three equal sheets, which are joined together every season when put on, and unjoined when laid afide; spars or rafters of two inches fguare are placed at the distance of four feet from each other, their upper ends being joined close to the copping, and their under ends to a stake drove into the border, at the distance of a foot from the wall. These are also made to remove at pleasure; pullies are fixed to the top of each spar, and the canvas is hoisted thereto by cords a little stronger than garden line. At first I clewed it at top; but, a strong gale of wind having almost tore it from the wall, I contrived to clew it at bottom, at the distance of a foot from the ground. Two people can unclew and hoist, or let down and clew, the whole in fifteen minutes. When nets are to be used, they should be doubled, and that in fuch a manner as to render the meshes as fmall as possible, and supported from the wall about a foot by pins, &c.

As, in the preceding Sections, I have given ample

ple directions for preparing the border, planting *, training, watering, washing, &c. it would be futile to repeat them here; and as it may be presumed the trees will produce no very considerable crop before the fourth season, I shall pass on to that time.

Some apply fire heat to their flued walls in the Spring. This I pointedly disapprove of, as no species of forcing is so intricate; the trees being placed between the extremes of heat and cold, and it being quite impossible to make or regulate a climate for them. All that is necessary for the production of a crop, is, ripening and hardening the wood in Autumn, and screening from frosty and boisterous winds in Spring.

By the time the buds begin to appear turgid in the Spring, let the screens be hung up: and, if canvas, let down in the day, from eight in the morning to five or six in the afternoon, in mild weather; but if boisterous frosty winds prevail, continue them all day. They should not be totally removed till about the middle of June; by which time the fruit will be fairly set, and all danger past.

About the first or middle of Angust, according to the season and forwardness of the fruit and wood, light the fires. These must be made very moderate

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* Before planting, there should be a trellis, or spars an inch square, fixed against the wall, to the height of the first course of the flue only; this being requisite to keep the young shoots from being scorched or anywise injured by the fire heat: and by the time it has returned into the second slue, the trees may lie against the wall without danger.

at first, and encreased as the season advances. If the surface of the wall about the second course of the slue is kept milk warm in the night, it is all that is necessary. And here observe, that the quantity of such must not be enlarged in a stormy night in the same degree as in a hot-house; otherwise all will be ruined. To attempt making a climate for the trees here is ridiculous, and also perfectly unnecessary; the sole intention in the application of fire, being to ripen the young shoots for the production of fruit next season.

The following quantity and proportion of small coal is taken at a medium, and what I have sound sufficient to work a well drawing surnace for years, viz. From the time of lighting the fire to about the tenth of September, sour ordinary shovels-full at five, and as much at nine in the evening; from the tenth of September to the middle of October, six shovels-full at the above times in the evening; and from the middle of October to the middle of November, six shovels-full at four in the evening, eight at nine, and three or four at seven in the morning.

The above is only given as a hint; and much is left to the nature of the season, and judgment of the operator.

CHAPTER

CHAPTER VIII.

PINES.

SECTION I.

On the Construction of the Pinery.

THAT few understand the cultivation of this most admirable fruit, is demonstrated by its being discontinued in many places where it has been tried for years. Some have also given up the cultivation of Pines, because of the expence attending it in respect of suel: the waste of which is greatly occasioned by the construction of the sire place and slues; which are generally ill adapted to the burning of wood or turf, without working the house unsteadily, and giving the person who attends them much trouble.

Such a furnace as is represented by Fig. 1. Plate V. is better calculated for burning wood or turf than any other I know of. And although I never had occasion to use that kind of fuel at Wemys Castle, where coal is plenty; yet, when at the Marquis of Townshend's

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in Norfolk, I was under the necessity of substituting other kinds of fuel for the use of the Pine stoves; and to burn which, I pulled down and altered my surnaces, from the common, to the plan as represented by the Plate. The suel I used was turf and screened embers, mixed in equal quantities; and a more steady fire I never used anywhere.

Pine stoves are variously constructed. Some are single pitted; some double; and some even triple; some have slues running under, and some round the bark bed. I disapprove of these; being very dangerous to the roots of the plants, if over heated. I also disapprove of double and triple stoves; as being very uneasy to work in stormy weather, and confining a vast quantity of stagnate unwholesome air in dull hazy weather. A stove, wherein you have a perfect command of sire heat, and can admit a free circulation of air in all parts thereof, is certainly to be preferred; and none can be so convenient for this purpose as a single one: and where it is in agitation to erect one, I would recommend such as is represented by Fig. 2. Plate I.

For the sake of uniformity, if placed in a range of vine and peach houses, &c. it may be raised to the same height with them; observing to raise the bark bed accordingly, the surface of which should not be farther than sour or sive seet from the glass in the middle. The succession house may also (if requisite) be of the same construction; and a nursing pit (See Fig. 1. Plate 1.) will be found to be of great advantage, and answer the purpose perfectly.

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The fituation is immaterial, providing the furface be dry, as the bark bed is raised above it and paved. And hence it appears that I do not approve of a border being made in front for the production of grapes to be trained up the rasters, which I esteem as being highly prejudicial to the Pines. For my method of preparing the border, and training vines in the Pinery, see Section xii. on the culture of the grape.

SECTION II.

On the Preparation of the Bark Bed.

HIS is an article of great importance to the welfare of the plants; and if not judiciously performed, is productive of much evil. It is no uncommon thing to hear of whole pits of Pines being burnt at the root by the over-heating of the bark bed; and Mr. Speechly and others give this as a principal reason for their using oak leaves. I have grown Pines thefe ten years, and can declare that I never had the roots of a fingle plant injured by bark heat; and if my method of preparation is strictly followed, I can be bold to augur that none ever will. The manner is the most simple imaginable. My opinion, in respect of the quantity and quality of bottom heat required by the Pine, has always been different from that of any other author I have read, or indeed any gardener I have converfed with on the fubject. I never wish my Pine plants (except in striking suckers,

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&c.) to stand in a bottom heat above that of blood heat at any time, and that too of a mild moist nature. If the watch-stick, to the depth of the bottom of the pot, feels just a little warm when felt with the hand, or applied to the cheek when the body is of a comfortable temperature, it is sufficient; and it certainly confifts with reason, that the bottom and superficial heat should correspond at all times. For the more effectual attainment of which, and that the roots may fustain no injury, I follow the following rules in turning and trenching the bed, viz. I never fift the tan in the pit at any time; never add above an eighth of new, which, if necessary, I give place to by skimming off a little of the furface of the old; never fuffer the new tan to lie within a foot of the surface, by which means the pots are entirely plunged in the old; I lay the half of whatever quantity of new tan is added in the bottom of the trench, and divide the other equally to within a foot of the furface of the bed: in trenching, I throw the fides to the middle, and the middle to the fides, that there may be an equal mixture of the old tan. Thus will the bed be of a mild and equal temperature from the first, and will continue much in the same state for three or four months; and, after the first filling, is attended with very little expence for new tan. From the above it is obvious, that, in filling the pit of a new Pinery, it should either be done several months before the plants are to be placed therein, or should be well sweated and wasted by turning, in an open shed, &c. but it would be advisable not to plunge the pots above half their depth, for the first two or three months after filling,

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in either case. In adding new tan, it should always be thrown up in an heap for eight or ten days before using, in order to drip and sweeten; and should never be applied fresh from the tan-yard; being both wet, and apt to heat violently and cake in the bed, if applied in that state.

Some object to tan on account of the expence and trouble attending the working with it; but, if the above method is practifed, these will be found to be inconsiderable; and, as the plants require frequent shifting, the stirring up of the bark bed at that time is a trisling trouble, and sometimes the addition of new tan is unnecessary.

I am convinced there is no ingredient can be substituted for tan, that will equally answer the purpose in the Pinery; and therefore would recommend the use of it, in preference to all others, where it can be procured on reasonable terms: but less or more of it is indispensably necessary.

Oak leaves are certainly the next best material; but they are not to be had in many places. Where they are used, I would advise that at least eighteen inches of well-reduced tan be laid on the surface, wherein to plunge the pots.

A mixture of stable dung and tree leaves of any kind, is the next best ingredient. But these should be well fermented before they are used, and at least two feet of reduced tan laid on the surface.

Some understand the reason why Pines are planted in pots instead of the surface of the bed, to be the want of permanent heat in it; that they may be removed with the greater facility in the time of renew-

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ing the bark, &c. This is not my opinion of the matter. For were the heat of the bed rendered ever fo permanent, I would grow my Pines in pots: and here let me observe, that I would never wish to be concerned in the culture of Pines, unless I had at least two distinct compartments for the purpose. All plants of any kind do not grow alike in their native clime; much less the Pine in an artificial one. Hence the necessity of at least two compartments, and growing the plants in pots; that they may be removed and classed, according to circumstances, with the greater ease and safety. Moreover, many plants (in any situation) do much better in pots than otherwise: of these are all the succulent tribe; and surely the Pine may be reckoned amongst them.

SECTION III.

On Propagating the Plants.

PINES are propagated most successfully by crowns, produced on the top of the fruit, and suckers from between the leaves, and from the root of the old plant. These last are the most despisable, and should never be used unless in a case of necessity. The crowns are twisted from off the fruit when served at table; the suckers, by breaking down the leaf immediately under, and moving them gently from side to side: and this is not to be done till the under part is ripe and of a brown colour, otherwise the sucker is apt to break by the middle.

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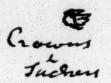
Much stress is laid on the article of drying them; fome recommending a week, others a fortnight, and fome the laying them on the shelves, flues, &c. of the stove: but if they are perfectly ripe, and the old plants have had no water for a week or two before they were taken off, (which they ought not,) nothing of this kind is necessary. The crowns are gathered one by one, as the fruit is used; and should be stuck into the bark bed till the whole crop, both of them and fuckers, can be potted together. Let a few of the bottom leaves be rubbed off with the thumb, and the under part of the stump smoothed with the knife; and place them in pots of three or four inches diameter and five or fix deep *, (according to their fizes,) filled with entire vegetable mould of decayed tree leaves; in the bottoms of which should previously be laid a little clean gravel, of the fize of horse beans, to the thickness of an inch.

Meantime, let the nursing pit be prepared for their reception; and, deviating from the rules given in last Section, let new tan, to the extent of a sisth or sixth part, be added, but none suffered to lie within

* Pots of this proportion are not generally to be had; but where there is a stock of Pine plants, there should be a set of pots of all sizes made for them on purpose, three or sour inches deeper in proportion to their width, than those in general use. My reason for which is, that a handful of clean gravel may be laid in the bottom of every pot, which I find is of infinite service to the plant: the Pine requires frequent refreshings with water, but will not bear the smallest degree of its stagnation.

ten or twelve inches of the surface. Here plunge the pots quite to the brim, in regular order, at the distance of two or three inches pot from pot each way, and keeping them perfectly level.

It may here be expected, that (according to the common cant) I should say whether crowns or suckers ought to be preferred. To be plain, I do not prefer a good sucker to a good crown; for, if the sucker has the advantage of being a stronger plant, it has also the disadvantage of running to fruit more untimeously than the crown.



SECTION IV.

On Preparing the Mould; and what Kind is fittest for the Pine Plant in its different State.

EGETABLE mould being a chief ingredient, a stock of it should be provided wherever the culture of the Pine is followed. The kind to be used here is that from decayed tree leaves, and those of the oak are to be preferred; but where a sufficient quantity of them cannot be had, a mixture with those of the ash, elm, birch, alder, maple, sycamore, &c. and indeed any kinds, that are not resinous, will answer very well.

In Autumn, and immediately as the leaves fall*, let

^{*} They should never be suffered to lie above a day or two, as thereby they lose much of their virtue, but should be directly

let them be gathered and thrown together into an heap, and if you have no mould of themselves, let just as much light loam, as will serve to keep them from being blown away by the wind, be thrown over them. In this state let them lie till May; and then turn them over and mix them well; they will be rendered into mould sit for use by next Spring; but from sticks, &c. being amongst them, will always require to be sifted before using.

Strong brown loam is the next article. This should consist of the sward of a pasture if possible, which should, previous to using, be well reduced by exposing it a whole year to the action of the weather.

Pigeon dung also, that has lien at least two whole years in an heap, and been frequently turned and well exposed to the weather is to be used. Also shell marle. And lastly, sea or river gravel, which should be sifted and kept in a dry place; such part of it as is about the size of marrow-fat peas is to be used.

This is the proportion:—For crowns and suckers, entire vegetable mould, with a little gravel at bottom, to strike in; afterwards three fourths vegetable mould, one fourth loam, mixed with about a twentieth part gravel, and a little entire gravel at bottom, till a year old. For year olds, and till shifted into fruiting pots,—one half vegetable mould, one half loam; to which add about a twentieth part gravel, and

rectly gathered into an heap, in order to bring on a fermentation while they retain their faline juices; and in order that these may not evaporate by their exposure to the air. and as much shell marle, with a little gravel at bottom as above. For fruiting in, one half loam, a fourth vegetable mould, a fourth pigeon dung, to which add gravel and marle as above, and lay two inches of entire gravel at bottom.

SECTION V.

On the Treatment of the Plants the first Year *.

If the plants were struck (as directed in Section third) about the first of September, the bed will continue of a kindly heat till the first or middle of November, and must then be worked over and about an eighth part of new tan trenched in. The plants will also have made good roots by this time, but will not generally require fresh potting; therefore let such only as are any wise matted be put into pots of the next size immediately above those they are in, observing to take off the matted part only, and put them in, balls entire.

Plunge them to the brim as before, and let them remain till the first of March.

At this time, let the bed be worked over as directed in Section fecond, the plants have the mould entirely shaken from their roots, put into the same pots,

* I reckon the year from the first of September, supposing the crop to be all cut, and the crowns and suckers struck at that time.

Whe plants thould betiened out of its present Ook with the ball of earth entire around its looks unless there is an appearance of unhealthyruss or any ways Defective. In Such Care it is Eligible to the dugler the from the Roots & this of all the Tarts that appear Lot to be aline —

March

and plunged as before. Here the roots which are fresh are not to be disturbed, only cutting away those that are wasted, and any rotten part about the bottom of the stump. They will now grow vigorously, and will again require potting about the first or middle of May; at which time let the bed also be stirred up to about half its depth, and if necessary, a very little new tan worked in. Put the plants into pots of about six inches * diameter on a medium, according to their sizes, with the balls entire; and if any of them are matted, displace that part; plunge them to the brim, at the distance of about † sisteen inches from centre to centre of the plant, and give a little water.

About the first of August they will require potting, and if there are three compartments, being removed into the succession house, let the bark bed be worked to the bottom at this time, the plants put into pots of eight inches diameter, plunged to the brim at the distance of sixteen inches on a medium, and settled with a little water.

SECTION

^{*} This is always to be understood as the inside diameter at top, and the particular number of inches specified, to be a medium for the plants according to their sizes.

⁺ This must be understood of the largest plants; a foot will be sufficient for the small ones.

SECTION VI.

On the Treatment of the Plants the Second Year.

BOUT the middle of November, the bark bed will require to be worked over to last for the Winter; the plants must not be shifted at this time, but let any decayed leaves about their bottoms be Novemba twisted off, and a little fresh mould be laid on the furface of the pots if requifite, and replunge them to the brim as before.—I would here observe, that I disapprove of the custom of tying up the leaves of Pine plants at the time of shifting or potting; the intention is to keep them from being bruised, but they are generally much more bruifed in the tying than when left loofe. My way is, to have a person standing opposite me in the time of potting, (this I perform on a stage about a yard high,) whose business is to hold up the leaves in a loofe, though regular manner between the arms, and prepare and hand me the pots, while another hands and fets aside the plants. In this manner have I often shifted an hundred one-year old plants in two hours.

> In carrying the plants through the doors of the stove, the person should turn back foremost, by which it is eafy to fave the leaves from injury, as in that case the pot goes first, and the leaves are drawn backwards.

By the first of March, the plants will again require shifting,

March shifting, and the bark bed trenching as before. Let the plants at this time be shaked out, and replaced in 1606 hum the same pots, in entire new mould, cutting off any out of flat decayed roots, or the end of the stumps, and twisting off a few of the bottom leaves, &c. Replunge them as before, and give a little water.

> About the first of June they must again be shifted. Work over the bark bed to about half its depth, and add a little fresh tan if necessary; place the plants, balls entire, into pots of about ten inches diameter, plunge them at the distance of eighteen inches from centre to centre, and fettle with a little water.

> In potting at all times, a few of the bottom leaves should be twisted off, that the plant may make fresh roots to furnish the furface, which also tends to keep it steady in the pot.

SECTION VII.

On the Treatment of the Plants the third Year.

Y the middle of August or first of September, the plants must be put into their fruiting pots, and placed in the fruiting stove; and for their reception, the bark bed therein must be prepared, by trenching it to the bottom, and adding about a tenth of new tan. Put the plants into pots of a foot diameter, plunge them to the brim, and give a little water. In potting, a fmall flick should be used to trindle down the mould between the ball and fide of the pot,



pot, fo as to leave no cavity, and this should be obferved at all times.

About the middle of November, the bed will require to be stirred to half its depth, and a little tan added; but the plants are not to be shifted at this time; therefore, replunge them to the brim again for the Winter. It is common at this time, to add a vast of new tan, in order to keep up a strong bottom heat through the Winter; than which, nothing can be more erroneous in my idea of the matter. I have already faid that the bottom and superficial heat ought to correspond at all times; and if the house is to be wrought to 60° only for the Winter, it certainly follows that a very moderate bottom heat is fufficient. The temperature of the house being so much reduced in Winter is to prevent the plants from starting too foon into fruit; and their doing fo, is frequently more in consequence of two much bottom heat, than irregularity in the temperature.

By the first of February, (the best showing season,) the bark bed will require trenching; and this is the a deviation only time of the year that I would advise a deviation from the rules given in Section fecond. From this time, the house is to be wrought as high as 70°, and that the bottom heat may keep regular pace with the fuperficial; new tan to the extent of a fixth part may be added. Such of the plants as are not shown, are healthy at the root, and stand erect and firm in the pot, should have a little fresh mould laid on the furface, by the removal of about two inches of the But let those that are already shown, and those that are anywife unhealthy, or appear stunted, be/ Shaked

shaked out entirely, and replaced with fresh mould in the same pots; but none of the roots, unless wasted, must be cut away.

The above, in respect of the plants that are shown, I presume, has never been recommended before; and I am happy in being enabled to do so with considence. It has ever been a matter to be regretted, that Pines, from the want of sun and air in the Winter months, are apt to be stunted, and show their fruit too soon. And that fruit so shown, seldom come to be of any considerable size or slavour; the plants so stunted, being unable to nourish the fruit; and these, from the want of sunshine in the early months, coming far short in slavour to those matured at a later period.

I first tried the experiment on a dozen of plants; the half of which were in, and the other half past the slower, at this time of the year. They were kept back a full month by the operation; those that were past the slower equalled, and those that were only in slower considerably exceeded any of the others of their own forwardness at the time of shifting. Being encouraged by my success, I treated my whole stock of fruiters, in the manner as directed above, the following season; they were kept back to a better season, and swelled their fruit to as good a size as those that showed in February.

About the first or middle of May, let the bark bed again be trenched to the bottom, a tenth of new tan added, and the plants replunged as before; and no farther trouble is requisite on this head.

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SECTION



SECTION VIII.

On the Temperature of the Pinery.

JOR the nursing pits, the fires will require to be lighted about the first of October. Work so as to keep the thermometer at nine at night, and feven or eight in the morning, as near to 65° as possible, till the first of March, and then gradually encrease to For the succession house, light the forces of

For the fuccession house, light the fires as above, according to the feason; keep at 60° till the first of March, and then gradually encrease to 65° for the season. And for the fruiting house, work to 60 degrees till the first of February, and then instantly rife to 68; encrease gradually to 72 degrees till the first of March, at which work for the season.

Although it is not practicable to work to a degree as here stated, yet the best endeavours should always be used to do so; and no person should have the management of the fires, who has not also that of the house.

SECTION

SECTION IX.

On the Admission of Air to the Pinery.

N Winter, even frosty air should be admitted, but that in a moderate degree, and always at the top of the house; but in fresh weather, at this season; air should be admitted to the extent that the thermometer may not rife to more than 5 degrees above the fire heat medium, and that till the middle of March; after which, and for the whole feafon, not more than 10 degrees. In Winter, I frequently make fires in the morning, folely for the purpose of enabling me to admit air, and at fame time keep up the temperature of the house. Although the Pine (from its nature) does not appear to quickly feel the effects of bad management, there are few plants in reality do it more fo; and too due an attention to the temperature of the house (especially in Winter) cannot be paid, the want of which is fure to throw the plants into fruit at an untimely season.

Very large portions of air should be admitted to the fruiting house while the fruit are ripening; it is not only essential to the slavouring of the fruit, but highly conducive to ripening and hardening the suckers.

Some shade their Pines at certain times. I never think I have too much sun.

SECTION X.

On Watering and Steaming the Pinery.

TATER must be given very sparingly in dull weather, particularly in Winter. about the first of October to the first or middle of March, once in eight or ten days will generally be fufficient, and that in very moderate quantities; but from March to October, plentiful waterings will be requisite, and considerable quantities at a time, generally once in three or four days. The crowns and fuckers must have no water for the first fortnight after planting; and none over head the first Winter, lest their hearts should damp. Indeed I do not water much over head, except in clear weather, in Winter. But, in the Summer months, my practice is, first, to give the quantity requisite to the root, from the spout of the watering pan; and then a sufficient quantity to wet every part of the leaves from the rose. My reason for which is, that I find the differ-Wakenng rent kinds of Pines require very different quantities of water. The Queen requires a third more than the King, Antigua, or Brown Sugar Loaf; and the Montferat and Green or Stript Sugar Loaf, require a medium between the two. I speak of plants in an equal state of health and fize.

The fruiting plants will require very large quantities, from the time they are out of flower, till they begin to colour; which should then be gradually with-

held,

held, and, towards its maturity, totally. This will enhance the flavour of the fruit, and perfect the ripening of the suckers. Water frequently with the drainings of a dunghill in the Summer months; but not in Winter: as at this time the plants are in a dormant state, imbibe little nourishment; and this kind of water causes a stench and foul air in the house, which cannot be so conveniently drawn off at this time as in Summer.

I neither think steaming necessary nor hurtful to the health of the Pine, except in hazy, dull weather in Winter, at which time it is certainly prejudicial. Therefore, if there are grapes in the stove, regulate this matter for their fakes alone without referve.

Soft and well-aired Water is to be used at all times: and applied either about eight in the morning, or four or five in the afternoon.

SECTION XI.

On the Maturation and Cutting of the Fruit.

COME kinds put forth suckers at the base of the fruit; which should be rubbed off as they appear. Others put forth suckers from the root; and, as these are not proper to be taken into the stock, they should also be twisted off, or otherwise destroyed, as they appear.

It is certain, that if a plant were to be divested of all its fuckers, the fruit would grow to a much larger fize in consequence; but, as this would ultimately

H 3

d bad

tend to the extirpation of the whole stock, it is by no means advisable. However, it is proper to reduce the number of fuckers on the plant to two or three at most. This should be done in the May shifting; and as the fuckers are about half grown at that time, you will be enabled to choose the best, and at same time eafily destroy the others by breaking out their hearts. But where the encrease of the stock is the object, all fuckers, even of the root, should be encouraged.

Some of the kinds grow on long footstalks, which are apt to bend down as the fruit gets heavy. These should be supported to small stakes, &c. For if the fruit fall over, the stalk will be bruised, and the nou-

rishment to the fruit thereby obstructed.

Pines loofe much of their flavour if suffered to grow till dead ripe; and where the gardener is not restricted, he should always cut them by the time the Tractice fruit has attained a greenish-yellow colour; and eithe puit on ther let them remain in the heart of the old plant, or ho accession lay them on the wall plate, &c. in the stove, for a mitsikfew days afterwards.

If required, Pines may be preserved in good order for feveral weeks after they are cut, in the following manner: -Cut them, as above, with the stalk as long as possible; put it into a bottle of pure water; which renew every two or three days; and at fame time pare a thin flice off the end of the stalk; and place it in a temperate and well-aired room of 60 degrees.

> It may be expected here, that I should say something in respect of the flavour of the different kinds. This I choose to avoid, as mens palates are as different as their minds; but I would observe, that the

Queen

Queen is most to be depended upon for a fure and regular crop. The Antiguas and Brown Sugar Loaf grow the largest of any, and make a noble appearance on the table; but they frequently fruit untimeoully. I have had a few plants of the Montserat which did not fruit till the fifth year; and I was then under the necessity of placing them in the green-house for a fortnight, in order to give them a check. The King is, of all others, my favourite; and I have been at much pains to discover the bent of its nature. I find it requires much less water, and a greater quantity of gravel, both in the mould and at the bottom of the pot, than any of the others.

SECTION XII.

On the Infects which infeft the Pine; and how to destroy them.

HESE are, the brown and white scaly insect, of the coccus tribe; to which may be added the But, as I could never discover that these last do any harm to the plant, and as they are feldom feen if the former are not present; I am rather inclined to think that their presence is in consequence of that of the coccus, on which they feem to feed. The brown fcale does no other injury to the plant than dirtying it, and therefore is of little consequence. But the white scale, or bug, is of the most mischievous nature to the plants; and where it abounds, little good may be expected of them. For my own part, I have been fo far lucky, that I have never had it in my

H4

power

power to try experiments for their destruction, but once; and as I was compleatly successful, I shall candidly lay my method before the reader.—

When I came to Wemys Castle, the whole * stock of Pines were infected to that degree, that I had obtained permission, and was determined to throw them out; but having built a nurfing pit, and not having immediate occasion for it, I bethought myself, and treated them in the following manner. I prepared a strong heat for them in the bark bed of the nursing pit; shaked out, and cut every fibre from their roots, (whereby they were rendered the fame as fuckers at first,) not excepting those that were in fruit, some of which were just in flower; dipped them into + liquor, (the same as is recommended Chapter third, Section feventh, excepting the turpentine); put them into pots of fix inches diameter, and plunged them to the brim; kept up a fire heat to about 75 degrees; gave them but little air; shaded them in sunshine; and gave them plentiful waterings over head with the same mixture reduced to about half its, former strength.

I continued this treatment for two whole months.

At the end of which, I again shaked out their roots, and washed the whole plant in pure water; put them into

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^{*} These were in a small stove in the old garden; the new garden and hot-houses not being then built.

[†] This experiment gave rife to my trying it for the other infects; but, whether from fancy or reality, I thought it ineffectual for the destruction of the caterpillar and grub without the addition of turpentine.

into fresh pots of eight inches diameter, and replunged them into a kindly heat in the other nursing pit; and treated them in all respects as I would any other plants. I never saw a vestige of the bug from that day to this; and of those very plants were produced my principal stock. A few indeed of those that were shown died; but the others produced such fruit as might be expected from plants of their size of any other kind.

CHAPTER

CHAPTER IX.

STRAWBERRIES.

THIS fruit is forced in most gardens where there are hot-houses of any kind; and, being generally understood, with equal success. I shall therefore be very brief in treating of it here; the only reason of my doing so at all, being to render this work as compleat and useful as possible.

Strawberries are brought to early perfection in the pine stove, vinery, peach house, &c. But, in my opinion, the cherry house is the sittest of all for its production, as the climate there coincides more nearly with its nature. As a compartment wholely for its use, slued pits are best adapted; and might be advantageously employed, in the latter part of the seafon, in the production of melons, &c.

In any fituation, the plants should have plenty free air, especially when setting and ripening; and be plentifully supplied with water till the fruit begin to colour; after which, very moderately.

My

My method of preparing the plants for forcing is this-In the middle of July, or first of August, (when the runners of Strawberries out of doors are producing fine young plants,) fill pots, of ten or twelve inches diameter, with strong rich loam; and plant three or four in each: fettle them with a little water; and place them behind a wall, &c. to shade them, till the plants have taken root; after which, plunge them to the brim in any dry open fituation in the garden. Drefs off their leaves in Autumn; cover them with a little litter in Winter, to prevent the pots being wasted by the frost; pinch off any flowers that may appear in the Spring; keep them clear of weeds, &c. in Summer, and in dry weather refresh them with a little water; and in Autumn dress off the leaves, &c. as before. They will be fit for forcing any time after Christmas. Of all the kinds, the scarlet is to be preferred.

As the plants are of no use after forcing, a quantity should be prepared as above, every season, where they are in request.

CHAPTER

CHAPTER X.

THE GREEN HOUSE.

SECTION I.

On the Construction of the Green House.

THIS compartment being an object of tafte alone, is more subject to diversity in its construction (and that too with more propriety) than any other in the garden. And although the gardener (if a judge) should have the sole direction in building the different species of forcing houses; yet the fancy of the proprietor, (I speak in general terms,) in respect of the Greenhouse or Conservatory, may be more fafely indulged in: fince nothing is at stake here in comparison to what is in the pinery, grapehouse, or peach-house. The construction of the fireplace and flues is of importance here, as well as in the hot-house; and, as the health of the plants in Winter depends much on the dryness or dampness of the floor, I would recommend that the flues be run under the pavement all round, the fire communicating

cating with the front one. Many Greenhouses are not paved. This, in my opinion, is erroneous; as the water that drops from the plants, in watering, causes much damp in Winter, which is very prejudicial to the health of the plants. Water so spilt should be instantly wiped up; and this cannot be done where the floor is of earth or fand. The floor should also be bedded upon a foot of brick bats, stone chips, or furnace ashes, &c.

Air and light, in Winter, being of the utmost confequence to the health of the plants, the free admiffion of them should be studied in the construction; and, at same time, that wherein a great deal of sire heat may not be required, which tends to draw the plants up weak in Winter and Spring.

Fig. 2. Plate V. represents the plan of an approved Greenhouse, for breeding and bringing young plants to an early flowering state. But where elegance in the building is studied, and the front is to be of free stone; masonry and architecture may have their sull sway, in any of the * orders but that of the Gothic, without much inconvenience to the plants: but this last, from the construction of the arches, is of too dark a nature for their welfare.

SECTION

^{*} The Greenhouse at Wemyss Castle is supposed to be the most elegant of any in this country. The front is of free-stone; and done to the Corinthian order, in the lightest manner. The windows are circular; whose width are six feet and an half each, and the pilasters only eighteen inches.——It is placed in the centre of the principal range of hot-houses, and has a very fine effect.

SECTION II.

On the Temperature of the Green-House.

ITTLE fire heat is necessary here; except in the time of a severe storm, or in long continued dull weather, to dry off damp. In the former case, the thermometer, in the night, should not stand above 45 degrees at any time; nor should it be under 40 degrees, as thereby many tender plants might suffer. In the latter case, it may sometimes be advisable to light pretty strong sires, in order to enable you to admit large portions of air: at which times, if the thermometer is above 35 degrees, it is sufficient.

SECTION III.

On the Admission of Air to the Green-House.

A 1R and light are of the utmost consequence to the welfare of the plants; and ought to be encouraged at all times. In some Greenhouses it is common to cover at night with canvas, mats, &c. in order to save suel in Winter. These should be always removed betimes in the morning, to admit the rays of light as they break from the horizon; and never put on at night till the twilight, to exclude them. A free and large circulation of air must be admitted,

admitted, according to the weather; even frosty air in Winter must not be entirely excluded, especially in fun-shine.

In the Spring, keep the house cool and well-aired; otherwise the plants will grow both too tender and too rapidly to bear the weather when put out of doors, without being much hurt at first: and for several weeks previous to putting out, the house should stand open, to its fullest extent, both night and day. Let it also remain open for several weeks after taking the plants in in Autumn, lest they begin to grow, which is not advisable at this time.

SECTION IV.

On Watering the Green-House.

CCORDING to the variety and nature of the plants herein contained, so is that of the quantity and frequency of watering: and hence the impropriety (not to fay impossibility) of any rule being given.

The judgment and discretion of the gardener must be here totally relied on; but a few hints may be useful. Plants are like infants: they will complain when hungry or thirsty; and, like them, too, should be timeously prevented by the indulgence and care of the nurse. Is it not painful to think, that an infant should cry and endure pain for what it cannot express? Even so with a plant. Lhave often felt

much

much pain in seeing a plant slagged for want of that element without which it could not long exist; and the more so, if want of attention was the cause.

On the other hand, an infant may be much hurt (nay, killed) by being too much glutted with food or drink, especially if of a bad quality. So it is with a plant. Therefore, the nicest observation is necessary to discover their natural inclinations; and which should be treated and encouraged in a kindly manner at all times.

In Winter, and when the plants are in a stagnate state, it is safest rather to give too little than too much water; and the contrary in Summer, and when the plants are in a vigorous growing state.

In the Spring, when in the house, and in dry weather in Summer, when out of doors, they should be occasionally washed with the hand engine, in order to resresh and keep the foliage clear of dust, &c. and in Winter, any water that may be spilt in watering should be carefully wiped up, to prevent noxious damp.

SECTION V.

On the Compost Mould to be used in the Green-House.

HAT I have said in the last Section, in respect of the nature and inclination of the plants, might with equal propriety be said here. I shall therefore only drop a few hints on this subject.

Many

Many kinds of mould are necessary to form the many different composts that are required; and where there are a great variety of plants, and their culture is industriously studied, the following ought not to be wanting:—

Clay, gravel, fand, strong loam, light loam, peat earth, moss, marle, vegetable mould, lime, and rotten dung. Out of which, according to the nature of the plant, may be formed a compost of any kind for its use.

SECTION VI.

General Observations.

It is necessary to put out the major part of Green-house plants in the Summer months, in order to harden and keep them in shape; but they should not be set out before the frosts are quite over, which is seldom before the first or middle of June. For two or three weeks, they should be placed behind a wall, or other sence, &c. to shade them from the violence of the sun, and keep them from being scorched or otherwise injured by the weather. Aster which, they may be placed in any form or situation which sancy requires; providing the exposure is such, that they may enjoy at least one half of whatever sun-shine there is. Here let them remain till the end of September or first of October, according to the weather.

Some of the tender kinds will require to be let fland longer in the house in the Spring, and taken sooner into it in Autumn, than the others.

The best time for general shifting or potting is when they are removed out of or into the house; but individuals may be fresh potted at any time.—
The luxurious growing kinds should be rather under potted, and kept in stiffssh foil; which will tend to check their growth. Let such of them which are

stragglers be neatly dressed to a rod.

These plants look much better when of an ordinary size, than when suffered to grow tall and with naked stems. Therefore, they should be frequently headed down and trimmed; so as to make them put forth young shoots in every part, if possible. They should also be divested of all dead branches and leaves as they appear, at all times.—Young plants of all kinds that will, should be struck every seafon; and the others propagated by layers, budding, or grafting, in order to keep up a stock.

On the stage, they should be placed, in manner of an amphitheatre, regular, thin, and the kinds as much intermixed as possible, which gives the better effect to the whole; and they should be frequently turned round to the sun, in order to make them

grow upright and equal on all fides.

The flower these plants grow, the better; providing they do grow, and are healthy.

The aphis and thrips are often very troublefome in the Greenhouse; which should therefore be frequently sumigated with tobacco.

CHAPTER

CHAPTER IV.

EXPLANATORY OF THE PLATES.

SECTION I.

Explanation of Plate I.

FIGURE i. represents the plan and section of two nursing-pits, on a construction that will equally answer the striking of young pine plants and forcing Asparagus, Cucumbers and Melons, Strawberries, French-Beans, Sallads, Flowers, &c.

For the conveniency of shifting, &c. the pit is sunk to the depth of a yard below the ground level, but where the situation is not perfectly dry this is not advisable; therefore, if the situation is damp, the pit should be built on the surface, and a sloping bank raised all round to the height of a yard against the sides and ends; and this I chiesly advise on account of the value of the front slue, which can be so easily rendered serviceable in raising early sallads, &c. &c. on a well prepared border immediately adjoining thereto, as already hinted in the note, page 8.

I 2

Here

Here the furnaces are placed behind, communicate first with the front flues, and return in the back singly. The surface of the bark-bed is level with the bottom of the flues all round, and consequently no apprehension of burning need be entertained, especially as the furnace is placed at the distance of two feet from the wall of the pit. The inner wall of the flue is a brick on edge, and for the sake of strength, the outer wall a brick on bed.

Although in this defign the divisions are but thirty feet long each, yet were a greater extent required, they may be made forty, as a furnace is perfectly capable of working that much, if of the same width.

One length of a fash is sufficient here, and they are wrought in manner of a common hot-bed, with fast-enings at top to keep them from slipping down.

Fig. 2. represents the plan and section of a single-pitted Pine stove on an improved and the most approved construction, either as a fruiting or succession house, wrought by two sires, and having a shed behind which will be found to be a great conveniency in many respects; such as the keeping of moulds, tan, &c. and it is also well adapted to the cultivation of mushrooms.

The bottom of the bark bed is level with the circumjacent ground, and the surface of it gently elevated, to the intent that the plants (when properly arranged) may enjoy an equal share of sun and light. Some pay little respect to this article, keeping the surface of the bed perfectly level, and placing the plants indiscriminately therein; but my method is to arrange the

plants

plants in manner of an amphitheatre, that they may the more equally enjoy the rays of the fun.

Trellifes are placed against the back wall and upright sashes in front, whereon to train the vines in this compartment, which is far preferable to the method of training them up the rasters as is generally practised. (See Section 12. on the Grape.)

Here must be two lengths of sashes on the roof; the under ones should all be made to move either up or down, and the upper ones to move down alternately, to the extent of half their lengths at least. It is immaterial whether the upright ones are made to slip or not, as by moving the under ones of the roof upwards, bottom air can be admitted equally well.

Here also would fallads, &c. sown on a well prepared border, close by the front wall, reap great advantage from the heat of the front slue, which in this compartment requires to be kept very hot all the Winter and Spring months, as having the greatest command on the temperature of the house.

SECTION II,

Explanation of Plate II.

FIGURE 1. represents the plan and section, and also the elevation of the front wall of a cherry-house, wrought by one fire, which communicates first with the front slue, and has two returns in the back wall; which returns are made on the supposition of

its being converted into a peach-house at pleasure; but while it is appropriated to the cultivation of cheries, the back flues should be shut by a damper. (See Chap. III. Sect. 1.

The trees are trained to a trellis placed against the back wall, and if the border is not occupied with French beans, sallads, slowers, &c. a row of dwarf standards may be planted in front, within two seet of the flue. Two rows of strawberries may also be placed on shelves hung against the upright sashes in front.

The front flue is here in the same manner as in the nursing-pits, and consequently the same advantage ought to be taken of it in respect of making a border

for raising early fallads, &c. in front.

It stands on pillars and arches, which last ought to be made as obtuse as possible; but where lintels can be procured, they are preserable, and should not be more than six inches thick. The pillars also should be no thicker than the length of a brick at most, that all the space possible may be allowed the roots.

The fashes should be of two lengths on the roof here also, all of which ought to be made to move,

but the upright ones may be made dead.

Fig. 2. represents the plan, section, and elevation of the front wall of an approved peach-house, which is also wrought by one fire, communicating first with the front slue, and returning twice in the back wall. As a greater degree of fire heat is required here (especially if the house is forced early) than in the cherry-house, the front slue is detached from the wall by a cavity

cavity in order to take advantage of all fides of the flue.

Pillars are raised for the support of it in common with the wall, which are also to be lintelled or obtusely arched.

Although plants fown on a border in front here, as in the cherry-house or nursing pits, would not be quite so much benefited by the fire heat; (owing to the cavity, and thickness of the front wall;) yet they will be considerably so, and it is very advisable to take advantage of it, as they will come in succession to those in front of the nursing-pit, stove, or cherry-house.

Here also the trees are trained to a trellis placed against the back wall; and although (owing to the narrowness of the house) dwarfs cannot be planted in the front, yet pots of strawberries, kidney-beans, slowers, &c. &c. may be placed on the flue, and on shelves hung against the front sashes, with great propriety.

The roof fashes are all to be made moveable here also, but the upright ones may be fixed.

In the plan of these houses, I have shewn no back-shed; but, if one is not erected, (which in some situations may be very improper,) the stock-hole should be enclosed with a wall, arched over, and a trap-door made to go down in form of a ship's hold, over which, when not at work, may be laid a little mould, &c. for concealment.

But where the appearance of the furnace is immaterial, it is also so whether it is covered over or not;

as, if they are built according to Fig. 1. Plate V. they will be found to draw well in any fituation.

Fig. 3. represents part of an espalier rail on an improved construction. Here the posts are set in blocks of stone, which are placed under the surface of the border; and, for durability, the ends of the posts are burned, and run in with pitch.

SECTION III.

Explanation of Plate III.

FIG. 1. represents the plan and section of an approved grape house, wrought by two fires. Here the front wall, and front flue, stand on pillars which are either to be lintelled or obtusely arched as above hinted. The vines are to be planted within a few inches of the front wall, and trained to a trellis which covers the whole roof.

Some build their front walls and flues on the furface of the border without arching them; this is by no means advisable; in which case, there is no possibility of effectually renewing or trenching the border without endangering the wall and slue, which operation is frequently necessary.

In this house, there are no upright sashes, the length of the roof being of the greatest importance here. In houses where grapes are trained on the roof, and which have upright sashes, I generally see that that part is but indifferently covered with wood or fruit; besides, it alters the pitch of the roof, which

in a house for a principal Summer crop is certainly of importance.

Here must be two lengths of sashes; all of which ought to be made to move at pleasure, in order to admit an equal and free circulation of air.

A house on this construction is also perfectly adapted to the cultivation of peaches; than which, I know not a fitter receptacle for the production of a principal crop; and, if requisite, it might be extended ten feet more in length, as the fires would, in that case, perfectly command a sufficient heat for peaches.

In this case trees are to be trained against the back trellis to the top, and on the front one to half its height only, that the trees on the back may not be shaded thereby.

Fig. 2. also represents the plan and section of a grape house wrought by two fires, whose front wall and slue stand on pillars, that the roots may have a free range, the plants being planted and trained to a trellis against the back wall.

This house is ten feet longer than the other, which owing to the width, two fires can equally command. The sashes are also to be double on the roof, made all moveable, and the uprights may be fixed.

Fig. 3. represents the elevation of the front wall of either house, as being the same, except in the length.

SECTION

SECTION IV.

Explanation of Plate IV.

FIG. 1. represents the plan and vertical section of two divisions of a hot-wall, on the newest and most improved construction.

Here the flue makes four returns, decreasing gradually towards the top of the wall, which is necessary to the distribution of an equality of heat to the surface; and here also the upper course of the flue is carried much nearer to the top of the wall than is usually done, which is of great utility in ripening the extreme shoots of the tree, these naturally growing later and more spungy than those of the other parts.

Some who give defigns for hot-walls, advise building the breast of the first flue a brick on bed, and that of the others a brick on edge, (without decreafing the depth of the flues as they ascend,) in order to give an equality of heat to the furface. But this matter is better accomplished by the gradual diminution of the flues, as here shewn, and the breast of all the flues are a brick on bed. A wall of this kind is more subject to the vicissitudes of the weather than a flue in a hot-house; and consequently, the breast of the flue being a brick on bed, will keep a more constant heat, when once warned, than when on edge. To prevent accidents, however, a trellis is to be fixed, or spars an inch thick, nailed against the first course of the flue whereon to dress the trees; after which

which they may be dressed to the wall without the least apprehension of danger. (See Chap. 7. Sect. 11.

Fig. 2. represents the plan and section of a mushroom house, wrought by one fire, and divided for the sake of producing them in succession, on a construction that has given much satisfaction for many years.

Little fire heat being required here, the flues of both divisions are gathered to the furnace, which works them both equally if required; and by the help of dampers the one can be wrought higher or lower than the other with the greatest facility; or by stopping the vent close, the one can be wrought quite independent of the other altogether.

It is a matter of little consequence in what situation this house is placed, providing the bottom of the mushroom beds be rendered perfectly dry.

SECTION V.

Explanation of Plate V.

FIG. 1. represents the plan and horizontal and vertical section of a surnace on the best construction yet discovered for the use of hot houses; and which, (from a conviction of its utility,) I would seriously advise a strict conformity to. It is laid down to a large scale, which, I hope, will be sound legible to, and understood by every operative person, with-

out the minutiæ of explanation. But it remains for me to give some directions for the working of it, and to describe that which constitutes its principal difference from the common ones.

In the common furnace the grate occupies the whole space allowed for the fuel, and is also generally placed on a level with the bottom of the flue, the entrance of which is thereby eafily choaked, which occasions what is termed an ill drawing furnace. And where the bottom of the flue is elevated above the grate, the consequence is worse; in which case, the fire burns with fuch rapidity, that it is next to impoffible to regulate the climate of the house to the degree required; besides, there is a great waste of suel. This is obviously occasioned by there being no space allowed to the fuel but the furface of the grate, through which, and confequently through the whole fuel, the current of air must pass into the flue; whereby the fire is fuddenly exhausted, and the flue heated to a much greater extent than is required perhaps.

In these furnaces, a fire will not last above three or four hours; which, in stormy weather, and in winter, occasions a constant attendance, perplexity, and impossibility of regulating a climate in the hot-house; but all these objections are obviated by the furnace as here represented. Here the grate does not occupy one third of the space allotted for the suel, and at same time, is sufficiently large to kindle the whole mass; which, when kindled, will keep of a moderate and equal temperature for many hours together. Here also the operator is not troubled with fresh lighting

tho

the fires every day;—I have often known them to keep in for ten days together without any addition of fuel. My method of regulating and working this furnace is as follows:

As after the first lighting for the season, there is always fire remaining in the back part of the furnace, in kindling up the fire in the evening, &c. I clear all the ashes from off the grate, and the spaces at the sides of it, and bring forward two or three shovel fulls of fire to the front; behind which, I throw the quantity of fresh fuel required, shut the door close, and in the space of an hour or so, revisit it to see how the fire is burning. If it is burning too flow, I stir it up by applying the fire-poker (the end of which is turned up) underneath the grate, thereby clearing the interflices of the bars the whole length; but if it is burning too rapidly, I open the furnace door a little way; by which means the current of air is divided, part of it passing over, and part of it through the fuel. In the space of another hour, I again pay it a visit; (having previously consulted the thermometer within;) and if the fire is consuming too fast, I open the furnace door accordingly; and if two flow, thut it close altogether.

This method is far preferable to that of working by dampers, it being very difficult to hit on the exact proportion of the aperture to be left in the vent; and besides, whatever air passes through the vent must also pass through the suel, and that two with greater velocity than when the damper is not shut at all, since by the partial contraction of the vent the current will be encreased.

In moderate weather, I generally find two fires fufficient for twenty-four hours; or rather, (strictly speaking.) a fire and an half: viz. a full fire, according to the season and temperature, the house is to be wrought to, about four or five in the evening, and half as much at nine at night. In fevere weather, three fires at most; viz. one at four in the evening, one at nine or ten, and one at fix or feven in the morning. here observe, that in this case, the furnace door will generally require to be quite opened after the fire is fairly kindled, as the flue will be kept constantly hot, by the flow foaking heat of the furnace. And this is none of the least of the advantages this furnace has over the other, as hereby the climate of the house is regulated, even in the most stormy weather, with a much greater degree of exactness.

The most proper fuel for the use of the hot-house is certainly small coal, such as is used for burning of lime, or in making salt; but by a small variation in the construction of the surnace, almost any kind of such may be used with success. Turf and screened embers mixed in equal quantities make an excellent sire, and for which there need be no alteration made in this plan; but for turf or wood alone, the surnace should be made at least a third larger, and the grate considerably smaller.

In justice to deceased worth, I beg leave to inform the reader, that my father was the inventor of this furnace.

Fig. 2. represents the plan and section of a greenhouse, on the most approved construction, for breed-

ing

ing young plants, and bringing them to an early flow-ering state.

Here are two stages, which are flatter than usual, with a walk between them, the one for the small and the other for the large plants. The flues are much wider than usual, and are carried under the pavement, which is bedded on a foot of stone chips, brick bats, &c. &c.

The roof and upright fashes should all be made to slip, in order to afford a free and regular circulation of air when required.

Fig. 3. represents the winter pruning of three vine plants, and part of a fourth and fifth, according to my method. (See Chap. 4. Sect. 5.) The scale that measures the green-house, also measures them.

SECTION VI.

General Observations on the Construction of Hot-Houses.

and substantiality in the construction of all hothouses. The materials ought to be of the best kind, the wood well-seasoned, and the workmanship well performed, in a plain and neat manner. The joiner ought to be very attentive in making true and handsome joints, otherwise he may expect them to grin in his face long before the end of the first year. The painter too ought to be careful in the performance of his part; if the colour is not well prepared and carefully applied, it is sure to scale off by the heat of the sun

fun in Summer. But to keep the wooden part of hothouses in good repair, they require to be painted on the outside every second year, and on the inside every fixth or seventh.

In glazing, I would seriously recommend crown glass, as being far superior to the common; it admits much more light in dull weather, and in sunshine enables you to give a much larger portion of air, and at same time keep up the same degree of heat, which is certainly a great object in forcing. Besides, it is now as cheap as the common.

The price of the supersicial foot of glass varying according to the size of the squares, it is of great importance not to make these too large; for instance, a square which is twelve inches on the side, and which contains just a foot of glass, is sold at ten pence; (I speak of third crown;) whereas, two squares eight and a half by eight and a half inches each, and which contains the same quantity to a mere fraction, is sold at sixpence halfpenny. So that the smaller the square, the cheaper the supersicial foot of glass; and this is occasioned by the small squares being cut from the broke or waste of the large ones, which, if the glass blower has no market for, he is under the necessity of re-melting.

From the above, I would not wish to infer that the squares should be made too small, as thereby the roof would not only be darkened by too many laps, but there would be too many astragals in the sash; and consequently the saving in glass, might be more than counterbalanced by the price of the sash work. The panes should be persectly square however, and

that

for the following reason—I find that they generally fplit longitudinally, (if not broke by accident;) which is occasioned by the wood, &c. swelling and contracting by the influence of the weather. The pane is not a whit worse; and, if it was perfectly square, is as useful in the same place as ever, by being taken out and reversed. For this purpose, the laps should be made half an inch at first, and now will be a quarter, which is fufficient.—I would here observe, that I pointedly disapprove of the method of puttying up the laps in glazing, as confining foul air in the house. The hot-house has as much need of a free circulation of fresh air at all moments, as the dwelling house; nay, more so. Do not the flues make foul air in the house every moment they are at work?

Earthen flues, that is, flues whose walls are of brick, and covers of tyle, are to be preferred to all others; as they keep the most constant and agreeable heat of any, and are also best adapted to the purpose of steaming, where required.

Where fire-brick and fire clay can be procured, all hot-house furnaces, and about ten seet of the slue nearest thereto, should be built therewith. This is more expensive at first; but in the end will be found to be a great saving, as they will last many years without need of repair.

Neat wooden or leaden spouts should be carried under the easing, and conducted to a cistern placed in some convenient place in the hot-house. No water is equal to that which falls from the heavens; and a very considerable quantity may be collected this way.

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In very wide houses, it is customary to erect light wooden or iron pillars to support the rasters, which are frequently a greater nuisance than ornament. This is done, not because of the inability of the rasters to bear the weight of the sashes; but because the rasters fall down in the middle, (which they would do even by their own weight,) and thereby obstruct the free running of the sashes in the admission of air, &c. There is a method of obviating this matter, and rendering the pillars useless; which, though very simple, is perhaps not generally understood, and therefore may be worth relating.

Where the rafter stands so upright as in Fig. 2. Plate III. it is in no danger of subsiding; but where it lies as stat as in Fig. 1. or as in Fig. 2. Plate I. it is necessary to follow this method, viz. Suppose the rafter is nine inches deep at either end, let it be made ten in the middle, rounding it gradually away to the extremities; whereby, when it comes to settle, the surface will become perfectly straight. This must be understood of the upper surface of the rafter and the sash beds, and not of the under side; which last will become roundish as it subsides.

In trellifing, iron wire is a great improvement, especially when placed or the roof, as in Fig. 1. Pl. III. It is not only more durable than wood, but is nearly as cheap at first, and is much lighter and neater. It should be well painted, to prevent it from rusting.

Hot-bed frames should be made with screw bolts at the corners, in order that they may be laid up when not in use, which is a great preservation to them. They generally suffer more decay by being exposed



to the weather in Winter, than all the time they are

in use in Spring and Summer.

I shall conclude this Chapter by observing, that, where there is an extensive variety of hot-houses, it is not only more convenient, but much more elegant, to have them standing in a range, than detached from one another. In this, uniformity ought to be studied. For instance, if there is a greenhouse, place it in the centre; and the other forcing houses in pairs, right and left, corresponding with each other respectively.

Although I have made the grape and peach houles fifteen feet high each, and the pine stove only twelve; yet, for the sake of the above uniformity, the stove may be made of equal height with them, only observing to raise the bark bed in the same pro-

portion.

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APPENDIX.

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APPENDIX,

CONTAINING

PLANTING AND TRAINING FRUIT-TREE BORDERS;

AGAINST WALLS, ESPALIERS, &c.

SECTION I.

On the Construction and Situation of Garden Walls and Espaliers.

In this country, this is a matter of the greatest importance: a garden without shelter and a tolerably good soil, so far as respects the production of fruit, will remain (comparatively speaking) a wilderness. Therefore, the greatest care is necessary in the choice of the site of the garden; and it is frequently very difficult to find both a sheltered situation and a kindly soil. The last object, however, (in my opinion,) ought to give way to the first, and that for the following reasons—In a compleat garden, different kinds of soil are absolutely necessary, particularly for the fruit-tree borders; and were it ever so bad, there is

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no

no difficulty in rendering it otherwise, and that in the space of a few months; but where shelter is wanting, many years (even where the soil is good) are requisite to the production of it, even in a tolerable degree.

A fine * garden is certainly a great luxury; and furely no gentleman would be at the expence of building and planting one, who would not also wish to see it in perfection, and partake of its fruits. As, then, as is presumed, it will never be in that perfection in this country without shelter, which it will be with it; it is surely preserable to lay down a garden in a sheltered situation with a bad soil, to laying it down in an unsheltered one with a good soil; since the one can be remedied in a few months, and the other perhaps not in a lifetime.

The happiest situation for a garden is, a gently elevated hill, having a south, south-east, or south-west aspect, encompassed on all sides with plantations at the distance of not less than one hundred yards, or more than two, from its walls. In this case, it should

^{*} The garden at Wemys Castle is placed in the middle of a plantation whose trees are an hundred feet high; for the site of which, and also the shrubbery, the whole ground was to clear. The half at least of the whole soil now within the walls was brought from the fields. The fruit-tree borders were all entirely made, and generally cut out of the rock; none of which are less than a yard deep. This was done merely for the sake of shelter; as there are situations hard by, where the soil is excellent, but without shelter. The garden was begun and finished within sixteen months.

should be made a parallelogram, whose length is equal to twice its breadth, (according to the fize required,) extending in length from east to west. This is not only the handsomest and most approved form of a garden; but it gives greater length of a south aspect than when made square. If the garden is very extensive, it should be equally divided by a wall running north and south.

Between the fore-mentioned plantations and walls, should be made a belt of low shrubbery, &c. walk, and border; that the walls may be covered on all sides with fruit trees.

Brick is certainly the best material for the construction of garden walls; as being both better
adapted to training, and of a more kindly nature for
the trees, than stone: and where the wall is not entirely composed of brick, should at least be lined.
But where these cannot be procured, and the wall is
to be built of stone, it should not be built in that
rough, and irregular manner which is too prevalent;
but should be neatly done in courses of not more
than six inches, and the surface in some measure
dressed with the iron, and rendered somewhat smooth
for the trees being dressed against, without the fear
of having their bark russed in windy weather.

Much has been faid concerning copping of garden walls: some advising no projection; and others three, sour, and some six, inches; and that in order to throw the drip off the soliage. All which, in my opinion, is of no importance whatever. The quantity of rain that falls on a two-foot wall is but trisling; and does it not frequently happen, that the wind K4 dashes

dashes it against the tree ere it reaches the ground, in either case?

The handsomest and most useful manner of copping is, to bevel off the stone to the thickness of two inches on each side of the wall, and give it as much projection; with a groove underneath, as is commonly practised.

The most eligible height for a garden wall, and that which suits the generality of fruit trees best, is sisteen feet; but where uniformity is studied, the height of the walls should correspond with the extent of the garden, or rather the apparent extent. However, I would wish the extremes to be fixed at twelve and eighteen feet. I would be understood here, as speaking of the height above the surface. And let it be observed, that no garden wall should be founded less than four feet, most kinds of trees requiring a yard of soil; and, as the borders may frequently require trenching, &c. it is advisable to have the foundation a foot deeper than the spade is to go, in the case of the border not being paved.

Espaliers are not only very ornamental, but useful, in the garden, and are much to be preferred to standards; which both overshadow the crops, and are liable to be shaken with boisterous winds, much to their detriment in the slowering and setting season. But, by being neatly dressed to a rail, many kinds of apples and pears will bear as well in this manner as if dressed to a wall.

Espaliers are generally (and that too with the greatest propriety) run parallel to the walls on the opposite side of the walk, and at the distance of three or four four feet from it. They are also run on each fide of the other principal walks which divide the garden, at the above distance from their edges; which, when well covered with healthy trees, form handsome avenues.

For a representation of part of an approved espalies rail, see Fig. 3. Plate II.

SECTION II.

On the Breadth, Depth, and Composition of the different Borders, for Apricots, Apples, Cherries, Figs, Pears, and Plums.

BY the rules of proportion in laying out of gardens, the border is to be as broad as the wall is high, and the walk half as much: and in this rule there is no variation, unless the wall is less than twelve feet in height, which, in my opinion, ought never to be the case; but if it is so, the border should not be less. For espaliers, twelve feet is the breadth.

The depth for apricots, apples, cherries, and figs, should be from two to three feet; that is, three feet at the wall, and two at the walk: and for pears and plums, half as much more at least.

If the fituation is wet, and the bottom a cankering gravel or clay, (which is far from being an eligible fituation for a garden,) drains must be run along the front of the border to the depth of the bottom, to carry off the wet; and a kindly bed must be made for the soil. This is most generally done by paving with brick, &c. but it is attended with an enormous expence

expence; and if the bottom is not rendered quite dry by draining, it is of little use. Therefore, let the draining be carefully performed; and practise the following method in making a bottom: which will be found to be preferable to any pavement, and much less expensive.—

Let the bottom be laid, in a sloping manner, from the wall to the drain, having a fall of fix inches. First, lay two inches of good loam, of any kind, which spread smooth, and pass the roller over; then, the same quantity of clean pit or river gravel, which also gently settle with the roller; over this, lay a second course of loam, to the depth of an inch only, and likewise pass the roller over it. All this is to be done while the materials are in a pretty dry state. But now the whole is to be made a little moift, and rolled till the furface becomes glazed; after which, water and roll alternately till it acquires a hard, shining confiftency, and the gravel is in a confiderable degree appearing through the loam. Thus will a bottom be formed, which no roots will penetrate, of a more kindly nature, and at a much less expence than brick or stone.

The composition for apricots, apples, cherries, and figs, is—three fourths light sandy loam, and one fourth strong clay loam, mixed with a competent quantity of stable dung; the apricots and figs requiring considerably more dung than the apples and cherries. For pears and plums—three sourths strong clay loam, and one sourth light sandy loam, mixed well with stable dung as above, and about a sistieth part of shell marle.

Such

Such (or nearly so) is the composition of the principal fruit borders at Wemys Castle; and I can be bold enough to affirm, that in sew instances have trees made equal progress in the same time. Yet I would by no means wish to infer, that of such composition only should fruit borders be made; it being clear to demonstration that they thrive and produce fruit well in different soils: but where the above materials can be procured, I would recommend a near conformity thereto.

To follow this mode of preparing fruit-tree borders, it is necessary to class the different kinds of trees; that is, to keep the pears and plums by themselves, and also the apples, cherries, &c. by themselves. And this is easily done, although there may be some of each placed on the same aspect; it is only determining on the quantity and space to be allowed for each kind, before preparing the border.

SECTION III.

On the different Kinds of the above Trees best adapted to this Climate; the Aspect they should be placed in; and the Distance from each other, according to the Height of the Wall, &c.

THE following is a list for the walls, and the aspect they are to be placed in; out of which, those marked thus * are to be preferred.—

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APPENDIX.

Names. Apples.	Aspect,
* Golden Pippin	S.
* Stone or Gogar do,	
# D'10 1	S. E. W.
Newton do.	S. E. W.
대한 이 경기 회에 가장 하면 가장 이렇게 하면 내가 되었다. 이번 이 경기 등에 살아 있다는 네트리트를 하고 있다.	S. E. W.
* Balgon do.	
* Golden Rennet	S.
* Golden Ruffet	S.
Royal do.	IV. E. VV.
	E.W.
	reidt S. Antol
Nonfuch	
Hawthorndean -	N. E. W.
t ad lost calmeds cancre so	dy alla bris
Apricots.	i sarbak
* Orange	S. E. W.
Roman	SEW
* Bruffels -	S. E. W.
* Breda	S. E. W.
Turkey	S. E. W.
* More Park	s.
Cherries.	
* May-Duke -	N. S. E. W.
Arch-Duke -	S. E. W.
* Holeman's Duke -	S. E. W.
* Black Heart	S. E. W.
White do	S. E. W.
Harrison's do.	S. E. W.
* Kentish	N. E. W.
* Morella	N. E. W.
· Andreila	14. L. W.

Names.

APPENDIX.

Names.			Aspect.	
Figs.				
* Blue Ischia			S.	
* Brown do.	•	4	S.	
* White do.	-	-	S.	
Black do.	•	-	- S.	
* Black Genoa			S.	
Brown Naples		•	- S.	
Pears.				
* Jargonelle	-	-	N.S.E.W	
Summer Bergam	ot	-	S. E. W.	
* Autumn do.	-	-	S. E. W.	
* Swifs do			S. E. W.	
Orange do.	-	-	S. E. W	
* Ganfell's do.		-	S. E. W.	
* Cressane do.		-	S.	
* Chaumontelle		-	S.	
* Burie de Roy	-	_	S. E. W	
Terling -	•	-	S. E. W.	
Swan Egg		_	E. W.	
* Grey Achan		-	N. E. W	
Colmar -		-	S. E. W.	
* St. Germain's		•	E.W.	
* Green Yair	-	-	N. E. W	•
* Black Worcester		-	N.E. W	
* Cedilac	-	-	N. E. W	
Warden	•	-	N.E. W	•
Plums.				
Black Morocco			S. E. W	
* White Magnum	Bon	um	S. E. W	
Red do.	-	-	E. W.	
* Green Gage			S.	
* La Royale			S.	
* Imperatrice	:	=	S.E. W	•

The

The following is a lift for the espailers; and, as these are generally equally and freely exposed, may be placed indiscrimately.—

Apples.

- * Ribston Pippins Kentish do. Paradise do. English Codling.
- * Kentish do.
- * Royal do. Dutch do.
- * Royal Ruffet. Wheeler's do.
- * Summer Pearmain.
- * Royal do.
- * Loan's do.

 Green Leadington.

 Grey do.
- * Summer Queening.
- * Winter do.
- * Yorkshire Green: Margill. Nonfuch.
- * Hawthorndean. Lady Wemyfs.
- * Norfolk Beafing.
 Strawberry.
 Purfementh.

Cherries.

- May Duke.
- * Kentish.
- * Morella.

Pears.

- * Crauford.
- * Jargonelle.
- * Yair.
- * Black Worcester.
- * Cadilac. Warden.
- * Achan.

Moorfowl Egg.

Drummond.

Summer Bergamot.

Scotch do.

Pinkle.

Out of which, those marked thus * are to be preferred.

The following is what I esteem a proper distance at which the above trees should ultimately stand on the wall: but, as they will be many years in filling their spaces, and as in most kinds a few crops may reasonably be expected before that time, riders of cherries, pears, and plums, may be placed between each of them; and these are to be had of all the above kinds.—

For a wall twelve feet high—the apples to be placed at twenty; apricots, thirty; cherries, eighteen; figs, twelve; pears, thirty; and plums, twenty feet apart. And for a wall fifteen feet high—apples, fifteen; apricots, twenty-four; cherries, fifteen; figs, ten; pears, twenty-four; and plums, fifteen feet apart. And fo in the fame proportion for walls of any height from twelve to eighteen feet, which, as I have already hinted, ought to be the extremes.

For espaliers—apples, thirty; cherries, sisteen; and pears, thirty seet apart. But these should be planted at double thickness, placing two of a kind together, that, in thinning them out, any of the kinds may not be extirpated.

Maiden trees, of all the kinds, ought to be preferred; and the feason for planting is, any time from the first of December to the first of March.

The pits should be filled in with rich light mould, and that for all the kinds without exception; as all trees are found to strike root most kindly in light soil, although their nature may require a very different kind afterwards. Care should also be taken not

to place them too deep; if the stem is covered two inches higher than it was when standing in the nursery, it is sufficient.

Let them be settled with a little water, and duly attended to with that element in dry weather the whole of the first Summer. Also, let a little mulch be laid round each of them; which will tend to keep their roots from being injured by the frost in Winter and the early part of Spring, and also from being scorched by the summer.

SECTION IV.

On Training the different Kinds of the above Trees on Walls and Espaliers.

I. APPLES. THESE trees may be trained either in the horizontal or fan manner, with great facility. But I prefer the fan manner, not only for them, but all other trees against walls; and that for these reasons, viz. You can make the tree fill its space sooner by one third of the time, and can also supply the loss of a branch with greater ease at any period of its age. But for apples on espaliers, or very low walls, the horizontal method of training is to be preferred, as the height of the espalier, &c. will not admit of fan training in a handsome manner. I shall, therefore, first treat of fan training as for walls, and then of horizontal training as for espaliers.

Fan

Fan Training.—After planting, let each of the shoots be headed down to three eyes, in order to make them push strong, and surnish the wall from the bottom; and when the young shoots have grown so long as to enable you to lay them in, lay one on each side (that is the lowest) perfectly horizontal, and divide the intermediate ones equally at the distance of ten or twelve inches. In Winter, shorten them all back to from one half to two thirds of their lengths, according to their strength.

Next feason, they will push vigorously. The undermost shoots on each side are to be continued in a horizontal direction, as before; and the others laid in at the distance of from nine to twelve inches, according to their strength, and kind of the trees, (some growing more gross, both in wood and soliage, than others;) and, in Winter, they are to be shortened back about one sourth of their lengths on a medium. Whatever laterals appear on them at any time are to be instantly pinched off.

Next feason, they will push strong; and many of the kinds will begin to shew fruit spurs on the last year's wood. They will also push many superstuous shoots; which must be pinched off at the second joint by the time they have grown to the length of eight or nine. Some rub off these as they appear; but as this frequently russes the bark, and thereby injures the tree, it is better to pinch them as above in Summer, and cut them clean off in the winter pruning: but if they push a second time in the course

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of the Summer, they are (in that case) to be rubbed off as they appear.

Continue the undermost shoot on each side in the fame direction, which is to be invariably done till the trees meet each other; and lay in the rest at the distance of twelve inches on a medium. And, in the winter pruning, shorten the strongest and farthest extended shoots only a few inches each, and lay the . others in at full length; unless it is necessary to shorten some of them a little for the purpose of making shoots to fill any thin part. This is forthwith to be done in the Winter prunings, never shortening for any purpose but that of filling the wall regularly; and the medium distance at which the branches are to be placed from each other, is nine inches in the fmall, and twelve in the large growing kinds. At this time, also, are the superfluous shoots, that were produced and shortened in Summer, to be cut neatly off; unless there be fruit spurs formed or forming on their under parts, which in many of the kinds frequently happens.

Next feason, most of the kinds will produce a few fruit, and will forthwith make more moderate shoots and plentiful fruit spurs: and must henceforth be treated in all respects as for last year; observing to dress them neatly and regularly to the wall at all times, and divest them of all supersuous and lateral shoots, as above directed.

Horizontal Training.—Young trees which have three shoots are to be preferred; but if there are but

two2

two, the weakest must be cut clean away, and the other retained, whereof to form the tree. But, for the sake of brevity, I shall suppose the tree consists of three shoots. After planting, let the middle shoot be headed down to nine inches; and the two side ones laid in at sull length in a horizontal and parallel direction, within nine inches of the ground if possible; and if their extremities are in anywise bruised, shorten them back a few inches, that they may push freely: but this is never to be repeated unless in like circumstances.

When the young shoots are of sufficient length, train that from the extremity of the principal stem or leader in an upright, and the two immediately below it in a horizontal direction, right and lest, and parallel to the two undermost branches of last year, which, as the stem was headed down to nine inches, will also lie at or about the same distance respectively. Produce the young shoots from the extremities of last year's branches in the same direction; and pinch off all the others, both on these and the stem, as directed for fan training.

As the horizontal shoots are never to be shortened unless their extremities are bruised by accident or hurt by the frost, and as all superfluous and lateral shoots are to be treated in manner as directed above; it may be unnecessary to say more of these. I shall therefore confine my observations to the stem or leader.

As the branches are to be produced from the stem, and laid in (if possible) at the distance of nine inches on a medium; and as in most kinds more than two pairs cannot be produced each season without run-

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n'ng the risk of irregularity; the stem must be headed down to eighteen or twenty inches, year by year, till the horizontal branches arrive at the top of the rail, &c. But this must be understood of apples in general, and that too when they are in a moderate state of health and vigour: for some kinds, and indeed any, when in a luxuriant state, will generally produce three pairs of shoots on the stem; which, in that case, must be left from thirty to thirty-six inches in length.

Great care should be taken in laying in the horizontal shoots which issue from the stem, that they be not split away in the operation. I generally lay them in in any position they will best lie, till they are sufficiently hardened to bear being laid in in their proper position; and I likewise generally lay in, or referve all the shoots that issue from the stem, till that time, (whether needful or not,) for sear of accidents.

II. APRICOTS.—As these trees bear both on spurs and the young shoots of last year, fan training is certainly to be preferred. Therefore, after planting, let them be headed down, and treated in all respects as directed above for apples, laying the shoots in at the distance of nine inches on a medium. But this is to be understood of the principal branches: for when these trees arrive at a bearing state, they frequently make fruit spurs or shoots of a few inches in length; which may also be suffered to lie at the distance of a few inches from each other. They also frequently make their fruit spurs in clusters: in which case, they

are to be neatly thinned out; generally referving those which lie nearest to the wall, that the fruit produced on them may be benefited by its influence. Indeed, although spurs which stand at a distance from the wall frequently produce bloom in abundance, it is seldom the fruit sets or comes to maturity on them: and therefore they may be considered as supersuous shoots, and thinned away with them in the winter prunings; unless they are sufficiently long to admit of being laid in, and the scarcity of blossom on the trees renders it advisable to do so.

The breast wood produced in Summer is to be shortened back to two or three joints, as directed for the apples; and also neatly cut away in Winter; unless bloom appear on them, which frequently happens if the tree is not in too luxuriant a state. In pruning of apricots, the greatest care should be taken at all times to make clean and handsome wounds; and also to prevent bruises of any kinds, either by the knife, hammer, or nails bearing against the branches, which are of much injury to the trees, they being apt to canker and gum at the slightest bruise.

III. CHERRIES.—These are also to be trained in the fan manner on the wall: and as all the kinds, except the Kentish and Morella, are apt to produce large clustered spurs when of age, and in a proper bearing state, they are to be allowed from nine to twelve inches between the principal branches; observing to lay them in, and shorten them in the manner as directed above for apples. The breast wood,

laterals,

laterals, &c. are also to be treated in the same manner at all times; and the same care is to be observed in respect of wounds and bruises as hinted above for the apricots: cherries, and indeed all stone fruit, being apt to canker and gum at every bruise.

The Kentish and Morella kinds, bearing principally on the young shoots of last year, are to be trained much in the manner of peaches, (See Chap. vii. Sect. iv.) and are to be laid in at the distance of six inches on a medium, divesting them of all lateral and superstuous shoots as above.

On espaliers, I have seen the attempt made to train cherries horizontally, but I never saw it accomplished handsomely; and would therefore advise fan-training, as above.

IV. Figs.—These trees, bearing on the young wood of last year, being naturally apt to run upwards, and put forth suckers from the root annually, should be trained in an upright manner resembling that of the vine. The soliage being very large, they require to be laid at the distance of a foot or sisteen inches between the young shoots: and as the distance between these is the principal object here, it is immaterial how near they lie to, or even if they cover or cross the old ones; and as these trees are apt to grow to the extremities, and consequently run into naked branches in the centre, a succession of young shoots from the bottom should be constantly encouraged.

When the trees arrive at a bearing state, (which they generally will do in the course of four or five years,) and as they show the fruit which is to be ri-

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pened next year on the shoots of this; let such as are not wanted for furnishing any part of the tree with wood, be stopped about the middle or end of July: which will cause them to shew and set their fruit sooner, and thereby be better established before the winter frosts set in, than when the shoots are suffered to grow late in the season.

V. Pears.—These, of all others, do best, and make the handsomest trees, in the horizontal manner; but they will fill their spaces sooner by a third, if not one half of the time, by fan training, which is certainly a great object. On espaliers, however, horizontal training is most advisable; and also on very low walls.

As I have been pretty explicit on both these methods in the first head of this Section, it will be unnecessary to repeat them here. I shall only, therefore, briefly remark any particular difference to be observed in the training of apples and pears in either manner.

Most kinds of Pears being apt to make longer spurs than apples, the branches are to be allowed two or three inches more between them respectively: and as their spurs are also apt to grow more clustered than apples in general, they are to be more carefully thinned in aged trees; observing to retain such parts of them as lie nearest the wall, in that operation.

As Pears are not so apt to shew fruit spurs, on the bottom part of the breast shoots shortened in Summer, as apples, these are generally to be cut clean off in the winter pruning; thereby giving the more room to the real spurs, and preventing a prosusion of useless

and superstuous shoots from rising the following seafon. This matter is but too seldom attended to in general.

As most kinds of Pears (especially if in proper soil) grow more luxuriantly when young than apples; in fan training, the leading branches, which require to be shortened for the production of fruit to fill the wall, may be lest at greater lengths in general; and in horizontal training, the stem or leader may also be lest ten or twelve inches longer in Pears than apples, as they will generally produce a pair of horizontal shoots more from it. The Jargonelle, however, ought to be an exception from this rule; as I have seldom found it produce more than two pairs of shoots from the stem, in a regular manner, annually.

VI. Plums.—Fan training is also to be preferred for these trees, for the reasons already given; nevertheless, they will make very handsome trees in general the horizontal way. In either case, they are to be treated much as already hinted; laying in the branches of the small growing kinds at the distance of seven or eight inches, and the others at nine or ten.

The spurs in most kinds are apt to grow in clusters, and at a considerable distance from the wall; which are to be thinned in manner as directed for the apricots, as being nearly allied to them in their nature. In fan training, the leading branches for the production of shoots to fill the wall, will generally require to be shortened about half their lengths, especially in

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the small kinds; and in the horizontal way, more than two pairs in the small kinds, and three in the others, will seldom be produced from the stem annually; which, of consequence, must be shortened to about sixteen or eighteen inches in the one case, and about twenty-four or thirty in the other.

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SECTION V.

eation is a fatule risk for start and seed on the principle.

General Observations on Training and Pruning, and on Thinning and Gathering the Fruit, &c.

THE health and beauty of a wall tree depends more on the regular arrangement of the young, than old wood: and consequently should be neatly and regularly dreffed at all times; but more particularly in the latter part of the feafon; that every advantage may be taken in ripening, not only the fruit, but the shoots and spurs for the production of a crop the following feafon. We but too frequently fee thefe trees totally neglected in the latter part of the feafon; particularly apricots, cherries, plums, &c.; which, when the crop is gathered, are generally no more thought of, or attended to: but this is very erroneous, as most of these trees grow a deal afterwards; and if the extremities of the shoots are not kept drest to the wall at this time, they will neither be ripened for the production of a crop, nor for enduring the winter frofts.

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Great care should be taken that no part of the branches be bound with the shred or tie, and that the heads of the nails do not bear against them; which, if they do, are fure to canker them. My rule is, to drive the nail rather in an oblique direction, inclining its head from the branch; and to allow as much room in the shred or tie as will at least admit of another shoot of the same size with it; and also, never to drive nor fuffer a fingle nail or shred to remain on any part of the tree, that is not absolutely wanted.

It is common to tie espalier trees with willow shoots; but I prefer tying with shreds of fresh matting. For I have often feen branches much injured by the willow shoots, when bearing hard against them, or neglected to be cut away in the winter pruning; these being of a hard wirey substance, and lasting over year. But in using matting, no danger of this kind need be apprehended; as the strands are not only foft and pliable, but will not last above a year, and of consequence the shoot cannot be injured although the tie should be neglected being cut.

Winter pruning and dreffing should be performed in good time, that is, before the buds begin to vegetate; otherwise they are in danger of being rubbed off in the operation. In ordinary feafons, apricots, cherries, pears, and plums should be finished by the first, and apples and figs by the end of March.

In horizontal training, it frequently happens that the buds on the stem do not break regularly; and sometimes a bud will remain in a dormant state the first, and push the second year; which if it does not, make an incision crosswife to the depth of the bark,

immediately

immediately above it: it will not fail to push the sollowing season.

In what is termed a bark-bound tree, (in which case, it has a sickly appearance in general, hard and shrivelled bark, makes weak shoots, with the leaves of a languid colour, and the stem and branches frequently covered with moss,) it is a good practice to rip the stem lengthwise, to the depth of the bark: but this is to be performed on apple and pear trees only; stone fruit (from their aptness to gum) not admitting of this operation, at least with propriety.

When a tree is in too luxuriant a state, and does not set to fruit, the knife should be used sparingly, keeping it rather thick of wood (but regular) for a season or two; and at same time let a trench be dug round its stem, and at the distance of sour or sive seet from it, so as to cut quite through all its roots. The check, which it thereby receives, will generally throw it into a bearing state in the course of a season or two.

It frequently happens, that after much pains has been taken in rearing and training a tree, it turns out to be of a very different kind from that for which it was planted: which is a great disappointment, as perhaps it occupies a space upon a much better aspect than it deserves; and were it to be removed, would occasion an unsightly blank on the wall for several years until a young tree silled its place. But, to remedy this, (at least in a considerable degree,) it is more advisable to engraft or inoculate (according to the kind) proper kinds upon its branches: in a horizontal-trained tree, near to the stem; and in a fantrained

trained tree, towards the bottom and lower extremities. This practice, however, is not advisable in very old trees, as in that case they would be very unsightly: it ought only to be done in case of disappointments as above, which are generally discovered within fix or seven years after planting.

In this variable climate, our prospect of a crop is frequently blasted in Spring, while the trees are in bloom and setting, especially in apricots, cherries, and plums. To secure which, canvas screens applied, or nets suspended, as directed in Chap. vii. Sect. ii. will be found of infinite advantage, and far preserable to the common method of screening with fir boughs.

Apples and apricots, in favourable seasons, are apt to set much more fruit than the tree is able, or should be allowed to produce: and should therefore be regularly thinned; the apples when about half grown, and the apricots when the stoning is fairly over. But, as no fixed rule can be given for this operation, the discretion of the gardener must be relied on; and the health and vigour of the trees must determine to what extent it is to be performed. In the More Park apricot, however, a fruit for every ten or twelve inches square of the superficial content of the tree, when in a healthy state, will be a good medium. This, by many, is esteemed the richest of all stone fruit, when well ripened, and ate off the tree.

What I have said in Chap. vii. Sect. viii. in respect of gathering peaches and nectarines, will equally apply here in respect of apricots and plums; and where Jargonelle pears, and some of the kinds of bergamots, should be ate off the tree, or at least within twenty-four hours after pulling, as they lose much of their flavour by keeping. The other kinds of apples, and pears in general, should not be gathered till their pips are of a blackish brown colour, and should then be laid in the store-room; which, for that purpose, should be sitted up with shallow shelves, so as to admit of but one course of the fruit, and room for the hand. Hence it would appear, that I disapprove of what is termed sweating of these fruits:—
they generally retain an ill slavour ever after.

The greatest care should be taken to prevent bruifes in these fruits, and they should be frequently looked over and picked. The store-room should also be well aired, and secured from frost in Winter.

SECTION VI.

On the Infects which generally infest Wall Trees; and how to destroy them.

THESE are, the green-fly, red-spider, caterpillar, grub, ear-wig, wood-louse, and wasp.

The green-fly is easily destroyed by a fumigation of tobacco; but this is sometimes performed with difficulty on open walls. My method is this:—I sprinkle the tree gently with water from the engine; then sumigate for the space of eight or ten minutes with

with the bellows, (by which time the vermin will be quite fick;) and afterwards give a hearty washing with the engine; by which means they are dashed to the ground, which I then dig over in order to bury them. This operation should be performed in a calm morning or evening; otherwise the smoke immediately evaporates, and of consequence is the less estectual.

The red-spider and grub are kept under with the engine in Summer, and effectually destroyed in Winter by the liquor, (See Ch. iii. Sect. vii.) and which is to be applied in a milk-warm state with the spunge, as there directed. It must also be applied some time before the buds begin to vegetate, that they be not rubbed off in the operation.

For enfnaring and catching the ear-wig and wood-louse, the following is my method:—Take a quantity of water reeds or strong wheat straw, and cut them into lengths of sive or six inches; place them all over the surface of the tree between the branches and wall, allowing two or three to every square yard; also lay a quantity on the ground at the bottom of the wall. In these the insects take shelter as soon as the morning sun appears on the surface of the wall; which, in an hour or two after, are to be blown into a bottle with a little water in it, replaced as before, and repeated every morning in the same manner till they are quite eradicated: which will generally be soon accomplished, as they are taken in vast quantities in this manner.

The only fure method of keeping the wasps under is by destroying their nests; but in rugged and rocky places

places this is not eafily accomplished. They are also ensured in great quantities by placing phials filled with honey and water, or sugar and small beer, against the walls; also by suspending small sticks covered with bird-lime, over which a little honey and water is poured at times.

The green-fly preys most on the peach, plum, and cherry; the red-spider on the apple, cherry, peach, and plum; the grub on the apricot and cherry, and sometimes the apple and pear; and the ear-wig, wood-louse, and wasp, on the fruits of all.

Washing with the garden engine is of infinite service to wall trees, and should be frequently performed in dry weather in the Summer months: it both refreshes, and keeps the trees clear of dust, &c. and also tends in a great measure to suppress insects of all kinds, particularly the red-spider.

Washing the branches and stem of trees, which are anywise mossed, with soap suds and sulphur, is also of great utility, and should be performed in Winter or early in the Spring; previously rubbing off the moss, &c. with the hand, and brushing the branches clean with a brush, such as is used for cleaning plate, &c.

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APPENDIX.

PART SECOND.

SECTION I.

HINTS ON THE CULTIVATION OF ORCHARD.

Situation.

ORCHARDS in this part of the united kingdom (Scotland) are an object of trivial concern at present; for excepting those of Clydesdale, some in the Carse of Gowrie, and a sew near Jedburgh, there are none of any note. It is certain, we (in Scotland) need not expect to cope with our sister country, in this respect; but it is equally certain there is a possibility of imitating, and even nearly approaching her in the productions of the orchard; or at least, so far as to answer the consumpt of the country, in good or even ordinary seasons.

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The productions of those in Clydesdale (which in some seasons is astonishing) are a proof in point, as a these are neither extensive, nor (excepting one) even kept in tolerable order. They are, however, capable of very great improvement, and with little expense and labour might be rendered productive in treble or

quadruple proportion, on an average of years.

Their fituations, and indeed the whole bank of the river, from the falls of Clyde to Hamilton, and thence to Bothwell Castle, &c. are so peculiarly adapted to the purpose, that I am convinced the proprietors could not occupy their land in any other way that would give a tenth of the return. The banks are in general steep, and in many places inaccessible to the plough; and these very feeps are beyond all other situations desirable for the purpose, especially those on the north side of the river, being exposed to the Sun, the banks reslecting his rays, and rendering the situation in some degree as if the trees were planted against a wall.

In this tract we find many acres covered with broom, bramble, brushwood, &c. which at present do not bring the proprietors, (perhaps) ten shillings an acre; and which are so admirably situated, and the soil so congenial, that were they converted into orchards, might, in a few years, bring * sifty pounds on an average.

This

^{*} There is a proof of more than I say, on the spot lately improved by Mr Harvey of Brownlee; it is a very steep bank, was overrun with bramble, briar, &c. and does not contain above an acre and an half, the far greater part of which, is not

This peculiarity of fituation is not confined to Clydesdale. There are many other dales in Scotland equally adapted to the purpose. But dales, and those through which a river meanders, are to be chosen in preference to all other situations: Because, first, their banks afford shelter from the winds by their frequent windings and turnings; secondly, their steep sides confine and resect the rays of the Sun, whereby the climate is rendered more mild and warm than in other situations; and thirdly, there is a constant vapour or effluvia arising from the river, which is particularly grateful to the trees while in bloom and setting; and also tends to soften the climate at that season of the year, which is frequently inimical to the setting of fruit in other situations.

In this case, the most desirable situation is the North, East, or t West bank, from the verge of the river (including the haugh or holm, if such there be) to within a few yards of the termination of the bank, more or less according to its steepness, so that the trees, when full grown, may be within its level, and thereby be screened from the Northern and other prevailing winds.

The haugh or holm on the opposite side of the river, and also the banks, if not very steep, in many cases may answer equally well; but if the bank is

yet arrived at a full bearing state; yet, this spot for some years back, has produced from seventy to one bundred pounds a year to the proprietor, who, as an improver in this, as well as many other respects, is a Gentleman of much merit.

+ Supposing the river to run parallel to any of these aspects, or to any aspect from East to West.

very steep, and the soil not particularly inviting, its occupation as an orchard will be attended with inferior success.

Many dales without a "river meandering," may also prove excellent situations; and many spots in any dale may prove more so than others; which may be occasioned by the super-excellence of soil, congeniality of subsoil, peculiarity of exposure, ease of access, happiness of shelter, &c. &c. But,

Unsbeltered plains are fituations, where success in rearing and bringing orchards to a state of maturity, will ever be precarious in this country.

Soil.

The soil most properly adapted to apples, is a brown loam of a middling texture, and which is at least eighteen inches deep, over a bottom of dry sand, gravel, or soft clay; in which they are sound in the highest health, and of greatest durability. Nevertheless, they will do well in many soils, such as sandy loams, gravelly loams, chalky loams, clayey loams, &c. &c. which are of various depths, and which also lie on various substrata, as chalk, limestone, dry rock, sand, clean gravel, &c. &c. But if the bottom is wet, and the subsoil a till, retentive clay, or irony gravel, clay, &c. little good may be expected of them for any length of time, if the upper soil is ever so good.

That most properly adapted to Pears, is a strong clayey loam, a yard in depth, over a bottom as above. The same exceptions as above, are also to be considered.

Cherries

Cherries and Plums are of little importance compared with Apples and Pears, being of no use whatever, unless there is an immediate consumption for them, from the circumstance of their not keeping. The soil which answers Apples and Pears, will answer Cherries and Plums respectively, and equally well.

It would be vain to attempt rearing an orchard, where the bottom is not either naturally dry, or is previously rendered so by draining; and this is to be observed in all cases and situations whatever. This reslection more naturally occurs in respect of slat or hollow ground, than otherwise; but it is as frequently necessary on steep banks, which are often interspersed with spouty or springy spots, occasioned by the different strata of which the higher ground is composed. To enter, however, into a systematic mode of draining, would be foreign to the subject here; and the reader is referred to Mr Elkington's, as explained by Mr Johnstone; being at once the most effectual and least expensive method.

Manure.

Orchard ground should be moderately enriched with the kinds most properly applicable to the soil. Compost is to be preferred to simples. If the soil is of a cold nature, a compost of lime, stable dung, pigeon dung, soot, ashes, &c. is to be advised. If light and hot, cow dung, loamy marle, pond-mud, scouring of ditches, &c. Or, as simples, any of the kinds which is best calculated to correct or enrich

the soil. Marles are eminently useful, and are also falutary food for fruit-trees of all kinds.

Kinds.

The kinds in cultivation at present, in my opinion, are too numerous. They are also very indistinct, being confused and misconstrued, by the many provincial names which are given for the same fruit. He who plants an orchard, has the undoubted right of indulgence in this respect. The following list is given as the one which I would adopt, were I in the predicament, viz.

Jargonell
Crauford
Green Yair

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Kentish do.	Achan
Royal Ruffet	Scotch Bergamo

Royal Pearmain	Worcester
Loans do.	Cadilac Cadilac
Summer do.	Cherries
Leadington	May Duke

Dead.ington	May Duke
Summer Queening	Black Heart
Winter do	Kentish

Winter do	Kentiin
Yorkshire Green	Morella
Nonfuch	Plums
White Hawthornden	Wine Sour
Norfolk beafing	Orleans

Norfolk beafing	Orleans
Strawberry	Blue Gage

Pears. White & Red Mag. Bon. Drummond

Culture

Culture.

Before planting, the soil is to be trenched to its full depth; and the manure well incorporated with it in the operation.

Maiden trees of all the kinds are to be preferred, having boles of three or four feet in length. The distance at which they should ultimately stand is, thirty feet either way, for Apples and Pears. Plums and Cherries, fix feet less respectively. As I by no means approve of a mixture of crops, or even of an under crop as a reimbursement for present expence, I would advise planting four trees for one that is to stand for good; that is, at fifteen feet each way for apples and pears, and twelve for plums and cherries. Three of these must be considered, and treated as temporary trees from the beginning, and ought to be chosen of the least durable, and at same time soonest bearing kinds, such as the Nonsuch and Hawthornden apples; Crauford and Yair pears; May Duke and Morella cherries, &c. which may be interspersed as temporaries amongst all kinds without discrimination.

The season for planting is from November to March, with equal success. The pits should be filled in with light compost of earth and manure, for all kinds, except the Nonsuch Apple, which is most durable, and also generally most fruitful without manure at any time; wherefore, in the annual dressing, manuring, &c. this tree is to be an exception, so far as not to injure the others by its treatment or neglect.

If the first summer proves dry and hot, let the

trees be frequently watered, and to retain the moifture, a little dung or other litter kept around them on the furface.

The only indulgence which I would subscribe to, in respect of an under erop is, a single row of Beans, Cabbage, Carrot, Peas, Potatoes, turnip, &c. in the center between the trees, and that only for a few years, and with a view of defraying the expence of hoeing and keeping the ground clean of weeds, &c. which is invariably to be done for the first ten or twelve years, or till the temporaries are removed. By this time the principals will be so far established in the soil, and advanced in strength and size, that the ground may safely be laid down in grass, so to remain, that their roots be no farther disturbed for seven or eight years; after which, it is to be periodically broke up every five or six, and moderately manured.

Previous to this, let a moderate quantity of manure be digged in every fecond year, observing to dig deepest, and apply most of the manure beyond the extremities of the roots, thereby preparing food for them as they advance. The criterion for relinquishing the practice of under cropping, is, when the roots of the trees respectively come into contact.

Pruning, &c.

Judicious pruning is of the utmost consequence, both to the welfare of the tree, and production of beautiful and well-sized fruit. That old trees produce diminutive fruit, is not perhaps, altogether because cause of their age, but because of the want of judicious and timely pruning; and as old, or at least established trees, are the surest bearers in general, it is subject of regret that so many instances are sound of total neglect in this particular. In all the Clydesdale orchards, there is not one tree in sifty in proper order in this respect.

From the day the tree is planted, to the day in which it is no longer suffered to "encumber the earth," it should undergo an annual visitation of the "pruning hook," which should be on the hand of one "who knoweth the fruitful and profitable branch, from the unfruitful, and that which is naught, and

perisheth."

This operation, however, is to be performed with caution, and moderation, especially on young trees, as too free an use of the knife, is attended with the consequence of too great a profusion of young shoots the following season. The tree should be kept moderately thin, and free of branches crossing each other, endeavouring to have every part of it regular, and sanned out towards the extremities; also, thinning out the clustered spurs (as in many kinds they form too thick) regularly, and cutting out such as are rotten, bruised, &c.

Let the temporary trees be thinned away, as the principals advance towards each other, and by the time their extremities meet, let them be entirely stubbed up.

In aged trees, which have been neglected, and are too thick of wood, spurs, &c. the pruning face and knife should be used with freedom at first, and that

in every part of the tree, without discrimination of fruitful or unfruitful branches.

By the judicious performance of this operation, it is incredible in what aftonishing degree a tree will renew its age; and will, forthwith for many years flourish, and produce excellent crops of fruit.

The season for performing the above operations, is any time from October to March, but after that time it is not advisable to handle fruit-trees, as the buds then begin to vegetate, and are easily displaced.

It is no uncommon thing to see apple, pear, and plum trees, &c. in great measure destroyed by moss. This is most generally occasioned, by the roots having touched a cankering bottom; but it is also frequently occasioned by the tree being kept too thick of wood, and consequently of foliage, which consines stagnantair about its branches, in dull hazey weather. It is of less bad consequence, if this is consined to the trunk, or strong branches only; but if the extremities and fruit spurs are affected, the juices will be obstructed in their circulation, and consequently the fruit will be more immediately injured.

Therefore the moss should be rubbed off every pruning season, and the branches and spurs anointed every second or third, with a solution of sulphur, and soap suds, in the sollowing proportion, viz. one pound soft soap, one pound slowers of sulphur, six gallons river or rain water, boiled all together for half an hour—applied when milk warm with a spunge.

If the trees are afflicted with the caterpillar, or grub, (which is frequently the case) the liquor, see p. 35, must be used instead of the above, being care-

ful to anoint the eyes of the buds, as it is there the eggs of the infects are chiefly lodged, from which they issue with the young shoot, and enclose themselves in the leaves, on which they feed, or perforate to the very great injury, and frequently the total destruction of the soliage; and consequently to the detriment and ultimate ruin of the tree.

Cattle in Orchards.

It is a prevalent custom to pasture in orchards.—I disapprove of the practice. It is too frequently the cause of total neglect of the fruit; the trees being often left unguarded, and consequently much damaged by the cattle browsing on the branches, and rubbing themselves against the boles.

Pasturing of sheep is attended with equally bad, (if not worse) consequences; as nothing is more pernicious than the oil or grease, which exudes from their wool, in rubbing themselves; which, if often repeated on the same tree, (and this is almost always the case, this animal instinctively following example, more than any other) has the effect of compleatly closing the pores of the trunk so rubbed, much to its detriment.

But I have other objections than these to this practice, viz. 1st, Until the trees have been about sifteen years in the ground, are well established, and the temporaries are all removed, the ground should not be laid down in grass. 2dly, If planted with the view of being an Orchard only, the trees will necessarily stand so thick, and the herbage be so much shaded,

that

that it will be of little value, and of a very bad quality for pasture. Lastly, I consider it as being prejudicial to the roots of the trees, (particularly in stiff wet soils) to be pent up in the earth, and retarded in their annual progress by the weight and constant treading of the cattle.

Wherefore, I would rather advise, that the under crop be used as cut grass, (which generally comes very early,) and this is found to pay better than pasturing; the sirst cutting, which is always had before the trees are full in leaf, being equal to the whole value of the pasture.

SECTION II.

Cultivation of Small Fruit.

THE method of planting standard Fruit trees, to divide the quarters of the kitchen garden, is now justly exploded. They are found to injure the under crops much. The method of planting currants and goosberries round the edges, and to subdivide the kitchen garden is also justly exploded; and they are now planted in quarters by themselves; so are rasp-berries and strawberries.

And hereby is an opportunity of changing crops also afforded, as the best method is to make new plantations of strawberries every fourth or fifth year; and of currants, goosberries, and raspberries, every feventh

Seventh or eighth. The three last named, having much the same effect on the soil, may not take place of one another with propriety; but may with strawberries, and also strawberries with any of them.

The ground should be trenched, and moderately enriched with any of the kinds of manure most properly applicable to the soil; which, for currants, goosberries, and raspberries, if not a perfect fand, cankering gravel, or wet, stubborn clay, will (with proper culture) produce them abundantly. Strawberries are an exception. They are most productive of fruit, and least so of straw, on a strong clayey loam, and in an open exposure. Nevertheless, we find them prolific, with proper culture, in many different soils-

If the ground is broke out from grass, let the turf be broke well; bury it in the bottom of the trench, and the manure one spit deep. If from ground which has been under tillage or kitchen crops, bury the one half in the bottom, and the other at one spit deep; observing to divide and break the soil well in the operation.

The methods of producing young plants of all the kinds being univerfally known, it would only be wasting time in faying more in that respect, than that they should be clean, healthy, and well rooted.

Currants and Goofeberries

Should be planted at from four to fix feet apart each way, according to the quality of the foil. The feafon

The feason is any time from November to the first of March.

Currants and goofeberries produce both on spurs, and the shoots of last year; but the fruit on the latter is always largest. Therefore, the shoots to be retained should be left at full length; and the plant ought to be regulatly thinned out, leaving these generally at the distance of from nine to twelve inches apart, and twisting off all suckers, &c. from the root, which take greatly from its strength.

Some goofeberries are of the weeping kind, and when heavy laden, the fruit is frequently much injured, and even dashed off by the branches dragging on the ground. To prevent which, a hoop should be fastened to stakes or pegs drove into the ground, and at the distance of a foot from it; to which let the branches be dressed in a regular manner.

Raspherries

Are also to be planted at from four to fix seet apart each way, according to the kind and quality of the soil. In good land, the Antwerp kinds require at least fix seet: the common, a foot or two less, as they do not grow so luxuriantly. I have seen a quarter of Antwerps, which averaged ten seet in height each shoot, and proportionally strong; some of which girted above three inches. They grow in a mixture of peat-earth and sandy loam of considerable depth.

Raspberries produce entirely on the shoots of last year, which are plentifully produced from the root every scason. In winter dressing, the old shoots are to be cleared away, and also the major part of the new, retaining three or four of the strongest only, otherwife the plant would be a perfect bush next season.

The most simple, and best mode of supporting them is, by twisting the shoots loosely together, and tying the extremity with a piece of spun-yarn, or strands of fresh matting:

Strawberries

Are to be planted, either in July or August, or in March or April, according to the forwardness of the feafon, in rows from twenty-four to thirty inches afunder, according to the kinds and quality of the foil, and at from fix to eight inches in the row; kept clean of weeds at all times; the straw cut in October; the rows rutted on each fide, left fix inches broad, and the intervals dug a full spade deep. A slight dunging each feafon, or a good one every fecond, will be sufficient to keep the land in heart.

Where the fituation is particularly inviting, and (which sometimes happens) the culture of any other crop would be attended with more difficulty; strawberries may be successfully continued on the same fpot for many years, by reverfing the rows and interfpaces, every third feason. This is attended with no manner of trouble, the runners planting themselves.

It is observable, that strawberries planted in manner as above, that is, in rows, are much more prolific of large fruit, than when planted thick in beds. In fingle detached rows, they are still more so; and are with propriety run round the alleys of the kitchen

garden

garden, in the double character of edgings, " ornas mental and fruitful."

Some, who are fanguine of the produce of their ground, introduce kitchen crops of all kinds amongst their currants, goodberries, and raspberries, and frequently with too little discrimination of which is the intended crop. Why are they planted by themselves at all? Is it not that they may be produced in the greater perfection? If so, why with open eyes thwart the original intention, by robbing the ground with burthensome crops of vegetables?

Nevertheless, I wish not to see an inch of land lost. There is certainly a medium. A single row of beans, broccoli, cabbage, caulissower, carrot, turnip, potatoes, &c. in the centre between the currant trees, &c. being sown or planted, would be conform to strict prudence. And here they would be of the very best quality, if the soil were congenial to their natures, as they would have full toom to extend.

I have seen excellent vegetables produced in this manner; but at same time have seen much injury done the fruit, by being too long persisted in. Till the fourth year, it may be practised; but not longer. Indeed, there would little (perhaps no) profit attend the practice after this time, as the fruit would sustain more injury than the value of the vegetables would indemnify; and these last would be lessened in value, by being overshadowed by the trees or bushes.

END OF BOOK FIRST.

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BOOK SECOND.

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INTRODUCTION.

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NECESSITY, which is justly faid to be the mother of invention, is the first and grand stimulus to industry. Hence the cause, why the northern nations are farther advanced in the arts of gardening and agriculture than the southern, most probably is, that the soil and climate are generally less favourable, and consequently less productive of the necessaries and comforts of life.

As commerce extended, and mankind began to have more intimate intercourse with one another, not only their real but imaginary wants were mutually discovered, and the means of gratification employed. The progress was long slowly progressive in our island;

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but within the present century, a spirit of useful improvement hath manifested itself in all orders of the community, unknown to other ages. The branches of gardening and agriculture have made rapid progress; but an ample sield is still lest open, in which the ingenious and industrious may display their talents and perseverance.

The various modes of raising food for man by cultivating the earth, are to be comprehended under the two general heads, gardening and agriculture. These go hand in hand, being nearly allied to one another; the chief constituent difference being in the implements used, and the manner of employing them. In the one, the labour is chiefly manual; but in the other, the far greater part is performed by aid of cattle.

The plough is a most useful instrument, but it is not so efficacious on a small scale as a spade. Hence the superiority of the garden over the field, in respect to the superabundance of produce.

The more we do for the foil, the more grateful will it be in return; and prudence as well as interest, shew the necessity of skillful industry, whether in gardening or agriculture, and spur on to improvement.

A just knowledge of the value and effect of manures, their application, the quality, nature, and pulverization of the soil, is the grand basis of agricultural improvement, and lead to all subsequent discoveries. These can be more minutely followed in gardening than agriculture, and also with less risque of disappointment. Hence have the discoveries and im-

gression in our island:

provements

provements in gardening generally been the forerunners of those in agriculture.

Inasmuch as not only garden vegetables, but grain, produce most abundantly on what is termed new land, effectual ploughing, digging, trenching, &c. would appear of the utmost importance. This matter is susceptible of being more effectually performed in gardening than agriculture, and is another reason why the garden is more productive than the field.

A third reason, in some instances, may be local situation, shelter, &c. But this does not always hold good, as many kinds of vegetables, particularly those most useful, are sound to do as well, if not better, in an open field garden, than in one which is sheltered.

Garden land is generally higher rented than that of the farm; a much smaller quantity is appropriated to the maintenance of a family; the occupier is under the necessity of using the utmost diligence, industry, and perseverance; and of working and manuring his ground to the utmost of his ability in hope of a return. Thus may another reason be deduced why the garden is more productive than the field. And, lastly,

Private gardens, being both an object of utility and amusement to the proprietor, are generally placed in the most favourable situations, well kept, manured, &c.

Nevertheless, the efforts of the most ikusul, in the produce of the more tender esculents, are often bassled; more especially if his soil be not congenial for the purpose. And who is he that can withstand all the casual occurences of weather, and vicissitudes of

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a variable climate? In fine, gardening and husbandry labour under many disadvantages in this country,
unknown to the fister kingdom, particularly in the
earlier part of the season. Not so much that the weather is more severe, (which indeed may be questioned,) but that it is more changeable, and that we are
less favoured with the visits of that refulgent luminary, the first stimulus, the very effence of vegetation.

To remedy, then, as far as may be in our power the disadvantages under which we labour, let us endeavour to render the climate more salubrious by the high cultivation of every spot of ground, in whatever way it shall be employed; which unquestionably hath a good effect, and goes far towards the attainment of this desirable object.

Draining comes first in point. For, while latent water remains in the body of the soil, we may despair of ever rendering it productive, in a superlative degree, of either vegetables*, grain, or timber. And happy is it for this country, that now a method of performing this most frequently necessary operation, is discovered and divulged to the world, than which, perhaps nothing could be a more valuable acquisition.

The reader will probably perceive, that I allude to Mr Elkington's, as explained by Mr Johnston. He is referred thereto.

Next

^{*} According to the general acceptation of the word; for vegetables embraces the whole of one of the kingdoms of nature.

Next to this, effectual ploughing, digging, trenching, incorporating, and areating the foil, would feem to stand forward and demand our particular attention. Let us bestow it. Let us not exhaust one part of the soil, while another remains in a state of inactivity, and is, perhaps, at same time equally capable of production. But rather let us bring up what probably has never, or at least for years past, been accustomed to the dividing rutt of the coulter, the penetrating thrust of the spade, and consequently, the produce of "food for man and beast;" and which, by being fresh and unexhausted, may afford a timely relief to that which is the contrary, overburthened, perhaps, by long and successive production.

But while we fearch after, and bring up this "hidden treasure," let us not be too sanguine. Let us be careful, in not bringing up in mixture with it, what would not fail to thwart our best intentions—cankering gravel, irony till, or corroding sand.

What next comes in point, and is eminently useful, whether for improving this new acquisition, or refreshing, and in great measure restoring the exhausted soil, is the discreet application of manure. There are many kinds of this most useful ingredient. The judicious will always apply that which is most evidently calculated to enrich and divide the soil, if over tenacious, or which will add adhesion, and also enrich it, if too light and porous.

Next follows, skilful and moderate cropping. In respect of the former, practice and experience alone can ensure success, and the attainment of perfection. In respect of the latter; whoever shall bear in mind,

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that it is as necessary for land to rest from producing as for man to rest from labour, and that it is of as bad consequence to overburthen land with crops at any time as man with labour, will not fail to tread the right path. Farther, it is certainly preferable to have an article good in quality, than twice the quantity which is, perhaps, neither nutritive nor wholesome. The judicious will always proportion the weight of crop to the strength and ability of the soil.

And this leads to another confideration, namely, that of weeds. Of all things in nature, where art hath connection, the most disgusting is that of a garden of weeds-a thing inconfistent in itself, and also with common fense. Do we fow or plant with the intention of reaping? Do we wish to raise wholesome and well-ripened crops? Do we look for re-imburfement and compensation for expence and labour? and, Do we, at fame time, negligently fuffer weeds to impoverish the soil, and rob the crop of the nourishment necessary to sustain and bring it to perfection, and confequently produce the defired return?—Let us bestow the attention this subject would seem to deferve, and we shall conclude, finally, that successful cultivation and production of vegetable food, in great measure, depends on the following desiderata:

A just knowledge of the quality of the soil; effectual draining; effectual ploughing; effectual digging; effectual trenching; discreet manuring; moderate cropping; careful weeding; industrious reaping; and judicious fallowing.

CHAPTER

CHAPTER 1.

ON THE PROPER DEPTH AND SITUATION OF GARDEN LAND.

HAT kitchen vegetables do best on what is termed new land, is a generally received opinion, and is also plainly demonstrated in many instances. It is also a common complaint among gardeners, that their ground (from what is termed worn out) will not produce certain kinds of vegetables: not that it is poor and hungry, or altogether inadapted to the production of them, (having perhaps formerly produced the very articles in great abundance;) but that the furface has been many years under thefe crops, and that they have not fufficient quantity of ground for a proper change. In walled gardens this complaint is most general; and it would appear to be occasioned by the expence of inclosing a sufficiency of ground to ferve the family, or in composing a body of foil of a competent depth.

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That many kinds of kitchen vegetables do as well (if not better) in an open field-garden, as in one that is inclosed with high walls, and sheltered (and perhaps shaded) with trees, is an undeniable fact: and, were it not for the production of the finer fruits, there would be little use in rearing garden walls at all. But the ground thus inclosed is certainly occupied with more propriety in the production of vegetables than any other crop. And, as is prefumed, the ground thus inclosed is to be occupied as a garden many years; that the walls have been built at a confiderable expence; that the ground is trenched, walks made and laid out at a confiderable expence also; and that, above all, it is defirable to have a supply of wholesome vegetables for the use of the kitchen, while the ground is thus occupied; -I shall drop a few hints on the method of obtaining this end, and which I have partly practifed * with fuccefs.

First, then, it is necessary to have a depth of soil from twenty-sour to thirty-six inches; which, in many instances, is not attainable without much expense and labour: but which, however, if the above object is kept in view, ought to be a secondary consideration, as it is but once doing; and the matter of from

I fay partly practifed, because the operation of it requires many years, and it has happened (by my change of fituation) to be out of my power to follow it fully out in practice. But I hope the theory will be found to be reasonable, and confistent with both horticultural and agricultural improvement; and that it will be followed out by some of the many ingenious improvers of land wherewith our country begins to abound.

den will, in most cases, be sufficient for its accomplishment. In this case, it is obvious, that whatever the depth of the natural soil lacks of twenty sour inches, is to be supplied by forcing, that is, carrying in soil from the adjacent fields: for it is not advisable to trench up and mix much of the sub-soil (of whatever texture it be) with it. Indeed, in many cases are gardens almost ruined by the injudicious admixture of the sub-soil with the surface mould.

Secondly, Situation is to be confidered. In page 150 I have already dropped fome hints on this head; and would here farther observe, that in few instances is it advisable to lay down a garden on a level spot, these seldom having a dry bottom, and being drained with much more difficulty, if requisite, than when there is a declivity. A north aspect is also to be avoided, and preference to be given to a south, south east, or south-west: but even an east or west aspect, in many cases, may prove excellent situations. A declivity of from a foot in twelve to a foot in thirty or forty will generally answer; but about one in twenty-sive has the happiest effect.

The rule I had laid down, and which I have (as above faid) partly practifed, is this, viz. To take three crops off the first surface, then trench three spit deep, by which the bottom and top is reversed, and the middle remains in the middle; take three crops off this surface, and then trench two spit, by which the top becomes the middle, and the middle the top; and take also three crops off this surface, and then trench three spit, by which, that which was last the middle,

and now top, becomes the bottom, and that which is now the bottom, and was the surface at first, now becomes surface again, after having rested six years. Proceed in this manner alternately; the one time trenching two spit, and the other three: by which means the surface will always be changed, and will rest six years and produce three.

Hence will there always be new foil * in the garden for the production of wholesome vegetables; and hence also will much less manure be required, than when the soil is shallow and the same surface constant-

ly in crop.

I have said above, that the soil should be from twenty-four to thirty fix inches deep: and I would not advise that it be much more, or at least that it be trenched to a greater depth; as thereby the surface would be buried too deep from the action of the weather and influence of the sun, and consequently would be crude and unmeliorated for some time after trenching up.

In fituations where the soil is only so deep as to allow of trenching two spit, and expence in making it deeper is grudged, the above hint may also be followed with advantage: as by regularly trenching every third or sourth year, the ground will rest half its time; and, if judiciously managed, and cropped in proper rotation, wholesome vegetables may be produced on it for many years successively.

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^{*} I presume the appellation is consistent with the idea we have of New Soil, as certainly in reality there is no such thing; but, by this process, it will be in great measure renovated.

In many instances, it may be inconvenient (nay, improper) to trench the whole garden over in the same season; nor do I wish to advance such a proposition: one half, or a third, may be more advisable, and also more convenient, and of which circumstances alone can determine.

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CHAPTER

CHAPTER II.

ON THE NATURE AND VARIETY OF GARDEN LAND;
WITH THE MEANS OF IMPROVEMENT.

IT is a happy circumstance that in many instances we meet with different soils in the same acre. In the same garden they should never be wanting; and where nature (or natural causes) hath been desicient, recourse must be had to art: inasmuch as the variety of vegetables to be cultivated require a variety of soils to produce them.

It would be absurd, however, to imagine, that for every particular vegetable there is to be a particular soil prepared. The variety of soil in any garden may with propriety be confined to the following—Strong clayey loam; light sandy loam; (which are the two grand objects:) a composition of one sourth strong, with three sourths light loam; half strong, and half light; and one sourth light, and three sourths strong. Which, with the proper application of manures, may be rendered productive of any of the known and commonly cultivated vegetables, in the highest degree of persection.

Forming

Forming and composing the soil of a garden, is certainly more easily accomplished before, or at the time the walls are building, than afterwards: and we often find, where that matter has not been properly attended to at first, and where even the expence of doing it afterwards would be chearfully bestowed, the principal obstacle is the cutting-up of the lawns, shrubbery, walks, &c. These considerations, however, ought to give way to the more folid advantages to be derived from the improvement of the kitchen garden; the more especially, as in the course of a season, and at a trisling expence, they may be replaced in all respects as they were.

In many cases also might the soil of the garden be improved in a very considerable degree at a small expence. Thus, where the bottom is wet, and the subsoil of a cankering nature,—by judicious draining, which is certainly one of the greatest improvements in this case: where the soil is stubborn,—by the addition of small gravel, sea sand wherein is a considerable quantity of small pebbles and shells, coal ashes, lime gravel, pounded brick bats *, brick kiln ashes, &c. &c. and, above all, by being carefully laid up in ridges in the winter months, and indeed at all times when not in crop, in such a manner as to give the greatest extent

^{*} I have witnessed the effects of pounded brick bats and brick-kiln ashes in mixture, which were applied freely, in fertilising a cold, wet, back-lying, clayey field, in an astonishing manner, by a single dressing. This is a proof that clay, after being burnt, is compleatly changed in nature and effect.

extent of surface for the weather to act upon: where the soil is a poor sand or gravel, &c.—by the addition of clay or strong clayey loam, scourings of ditches which run through a clayey sub-soil, pond mud in a like situation, or scrapings of roads, &c. which lie in a clayey district, &c. &c.

Ridging-up of land, as above hinted, has the happiest effect, especially for stiff soils, and should never be omitted when the ground is not under crop. In dead sandy loams, also, and in cankering gravels, it is of infinite advantage for meliorating them: but in very light sandy soils, it is not adviseable to carry this practice to too great an excess. For it is a fact proven by experience, that, by exposing soil to the sun's rays in part, by throwing it into a heap, whereby it is also partly shaded, and trenching it once in two or three months, will sooner restore it to fertility than any other process, exclusively of adding sresh matter.

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CHAPTER III.

ON MANURES, AND THEIR APPLICATION.

THOSE most to be preferred for the use of the kitchen garden are—stable dung, cow dung, sheep dung, pigeon dung, soot, lime, loamy marle, shell marle, sea weed, wood ashes, whin ashes *, sern ashes, coal ashes, vegetable mould of decayed tree leaves; and vegetable mould of decayed vegetables of all kinds, as, cabbage leaves, haulm, weeds, &c. to which may be added with much propriety, although a fluid substance, the richest of all, and that in which is most of the food of vegetables, viz. the drainings of the dunghill.

Manures are to be applied either as simples or compounds; but the latter method is certainly the most eligible. For certain it is, that if they have not undergone

I have also witnessed the assonishing effects of whin ashes alone, in producing herbage in a five or fix fold degree; which was the more obvious on account that the field on which they were applied was much alike in quality, (a stiff wet, clayey loam,) and the ashes were applied partially. The effect was visible for several successive years. Also, on the timber trees with which the field was afterwards planted.

dergone a proper fermentation, their effects are, giving a rank and disagreeable flavour to fruits and vegetables; and if an immoderate quantity is applied, of producing a considerable degree of unwholesomeness, and tainting the juices of all plants.

A combination of stable dung, sea weed, lime, and vegetable mould, which has lain in a heap for three or four months, and has been two or three times turned during that period, will make an excellent manure for most kinds of garden land. Also, cow dung and sheep dung, mixed with soot or any of the kinds of ashes. Pigeon dung, marle, and vegetable mould, well mixed, will also make an excellent manure for heavy land; or even for lighter soils, providing the pigeon dung be used sparingly.

Pigeon dung, lime, foot, ashes, &c. should never be applied as simples; the quantity of them required being comparatively small, and the regular distribution difficult with the admixture of other matter.

Marle is an excellent manure for almost any soil; and may be applied as a simple with as much propriety as any of the kinds of cattle dung, or even vegetable earth. The kind called shell marle is much to be preferred; and should be freely applied to strong lands, but sparingly to light: the loamy kind being best adapted to light lands.

Stable dung (if used as a simple) should not be applied in too rank a state, nor should it be too much fermented. It should generally lie in a heap for two or three months; during which time it should be turned twice or thrice. A ton of it in this state, is worth three that has been used in the hot bed, and is

a year old. This manure, and indeed dung of any kind, when applied as simples, should never be carried from the heap to the ground till it is to be digged in; as, by its exposure to the air, the virtues evaporate, and it is the less effectual.

The necessity of the instant application of sea weed after landing, (if used as a simple,) is even greater than the above; as it instantly corrupts, and its juices not only evaporate, but slow downwards, and are lost. If this manure is used as a compound, the heap wherein it is compounded should be more frequently turned on its account; that none of the juices may be lost, but that the other part of the compost may absorb them.

Vegetable mould may either be used as a simple or a compound, and is to be applied with equal propriety to all soils. None can be hurt by it in any degree; since almost every plant will grow luxuriantly in it entirely, without the aid of any soil or manure whatever. It seems to be the ambrosia, and the dunghill drainings the nectar, of vegetable life. The latter, however, if too freely indulged in, is rather of an intoxicating nature.

The importance and effect + of manure being now generally credited and acknowledged, (at least much N more

We may briefly define the effect of manures, when properly applied, thus: Correcting tenacity, crudity, and porofity in the foil; exciting its fermentation, communicating nutritive matter, and affording nourishment to the roots of plants; there, by promoting vegetation, and their perfection.

more so lately than heretosore;) it would appear to be the indispensable duty of every gardener and cultivator of the earth to be very careful in the collection of it, and also to distribute it with the most skilful frugality. For this purpose, a well, cistern, &c. should be contrived so as to collect the dunghill drainings; and in the application of manure of any kind, the greatest care should be taken to divide it equally, according to the quantity to be applied.

The dunghill may be considerably encreased by throwing the haulm, stalks, and leaves of all vegetables into a common heap, letting them remain till well rotted, and afterwards mixing them with lime, marle, ashes, soot, &c. or in the process of collection. Watering the whole frequently with the drainings of the

dung-hill, would greatly enhance its value.

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CHAPTER IV.

CULTURE OF KITCHEN VEGETABLES.

SECTION I.

ARTICHOKES.

THIS plant will grow freely in light loam of any kind, providing it be well enriched with stable dung, marle, or sea weed. It requires a depth of soil from twenty-four to thirty inches, to produce it in perfection. In stiff, wet lands they frequently perish in winter.

It is propagated by offsets from the old stools, which are produced every spring in great abundance, and are to be planted in patches of two or three plants each, at the distance of four seet, patch from patch each way, watered frequently in dry weather, the first summer, and kept clean of weeds. As this plant is very tender, and quickly killed by frost, the rows, &c. should be carefully covered with stable dung, or other litter, in the early part of winter, which is preserable to the method of digging trenches, and moulding up with the earth dug therefrom,

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as the roots are thereby doubly exposed. In a thoufand instances were the whole stock of Artichokes killed, by the early setting in of the frost in 1796, which lasted but three weeks, and was far from what may be termed severe. And many of these were landed up; but none that were well covered suffered.

In spring, i. e. about the sirst or middle of March, the littery part of the covering is to be removed, and the small, or rotten part digged in, previously reducing the number of plants on each stool to three or four of the strongest; as otherwise they would grow too thick, and the fruit, in consequence, would be rendered small.

One hoeing will generally be fufficient for the season, as no weed will grow under their foliage, and these will soon cover the whole ground.

The above culture is to be repeated every season, for the old stools; and where a succession of Artichokes are in request, a few young ones should be planted every year. They will produce in autumn, in succession to the old ones, and last till the frost destroys them. Old stools should not be suffered to remain above seven or eight years in the same spot, otherwise they produce diminitively.

SECTION IL

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ASPARAGUS

This vegetable is most successfully produced on a light sandy loam of at least two seet. And the best manures, in this case, are—a compost of stable or

cow

equally

cow dung, sea weed, marle, and vegetable earth; or, stable dung and vegetable earth; or, sea weed and any of the above. Strong loam does not answer well for Asparagus; but it may be much improved by the addition of gravely loam, light fandy loam, fea gravel, brick bats pounded and mixed with the kiln ashes, &c. [&c. In this case, the best manures are-a compost of vegetable earth, foot, pigeon dung, and any of the kinds of ashes; or, stable dung, sea weed, and shell marle; or, sheep dung, sea weed, and marle; or, fea weed, stable dung, or shell marle, as fimples.

As Asparagus does not come to maturity for several years; and as there is no possibility of effectually manuring it after fowing or planting, without hurting its roots, (which are very brittle,) the greatest care is necessary in preparing the ground for its reception, which should be trenched at least two feet deep, and the manure well mixed with the foil in the operation.

It is common to raise Asparagus on a seed bed; and transplant it into beds of four feet wide, with alleys of two feet between them. In some instances, the beds are only two feet, and contain but two rows, with alleys also of two feet. This method is preferable to the former. But the most approved, is, to drill in the feed where it is to remain in fingle rows, a yard apart*; even four feet would not be too much. I have feen an instance where a piece of ground was N 3

* The middle of March or first of April, is the proper seafon for fowing.

equally trenched and manured, the one half of it drilled at one yard, and the other at two apart: that which stood at two yards (as I was affured by the proprie-produced a greater quantity of grass on the same quantity of ground than the other, and the buds were much larger.

That Asparagus, which is sown where it is to remain, will be stronger, against the third year, than that which is transplanted, I have myself proved in more than one instance; and would therefore advise this practice in preference to the other.

The best manures, and most proper application, for the rows or beds of Asparagus, is—the drainings of the dunghill, which may be applied at any time; sea weed, which may be applied at any time from October to March, and should be spread on the surface as it is carried from the shore; and stable dung, which should be spread on the surface about October or November, and let remain till the first of March.

This last is the common method of manuring asparagus land: but there are many who do so merely because they see others do it; and who imagine it to be done in order to preserve the plants from the effects of frost, and of consequence they choose the most littery part of the dung for this purpose. This idea is erroneous; and I have sufficiently proved that asparagus roots will in nowise be injured by the severest frost. In the very severe Winter of 1794-5, there was no covering of any kind on my Asparagus, nor was it even what is termed landed up. Indeed (to ute this phrase) I never land up my Asparagus till the first of March.

Instead

Instead of landing-up in Autumn, I clear the surface of weeds, &c. and stir it up to the depth of two or three inches with the fork; that it may the more freely receive, not only the juices of any manure that is applied, but be more readily acted upon by the weather. In Spring, if it has been covered with stable dung or sea weed, I gather off the rough part of it, and slightly point in the small; at same time shedding a little mould on the rows, being careful not to go too near the roots of the plants, as these, if possible, should never be disturbed. This operation is to be performed about the first or second week in March.

Asparagus beds should not lie above eight or ten years; but where it is in rows, it may lie considerably longer. However, where the forcing of it is practised, it is seldom suffered to lie even that time; as plants of from four to eight years old are sittest for this purpose.

In respect of cutting, the third year should arrive at any rate, even if the grass is sufficiently strong the second, (which, however, is seldom the case:) because, by being cut too soon, it weakens the roots much; and the encouragement of these, till the grass is perfectly established, is a principal object.

We often see blanks in Asparagus beds, &c. that are producing, which were not originally in them, or before the grass was begun to be cut. This is occasioned by injudicious cutting; and not, as is generally supposed, by accidental natural causes: and what occasions it is evidently that, in cutting, all the stalks of some of the plants are cut; which, although they may

put forth the next Spring, (but this they will in some instances do in Autumn. See note, page 3.) do so in a very weak manner, and perish the following Winter. Wherefore, care should be taken to leave at least one or two buds to each plant in order to draw nourishment, and encourage the growth of the roots.

SECTION IIL

BEANS,

Do best in strong land; but are successfully produced on almost any kind of garden ground. In gardening, the land is seldom manured for a Bean crop, as they generally sollow that of cabbage, caullissower, &c. which are commonly planted on well prepared ground.

For an early crop, few of the Mazagan or Lisbon kinds, on an early border, in a fouth aspect, in rows twenty inches apart, about the first of January. And for successional crops, sow or plant in an open exposure, of the Long-pod, Windsor, Sandwich, Toker, &c. &c. in rows from twenty sour to thirty inches apart, from the first of February to the first of June, at intervals of about three weeks.

They are invariably to be kept clean of weeds, and earthed up at two different times, viz. first, when the plants are about two inches high, and, lastly, when they are about ten or twelve. Topping the early crops, about the time the pods are distinguishable on the lower part of the stalks, is of advantage—the pods will swell considerably sooner in consequence.

SECT,

SECTION IV.

BROCOLI

Delights in a strong loam, but will do well in any common garden land, if well enriched with stable or cow dung. Where a succession of it is required, a little should be sown on an open light spot about the middle of March, and planted out about the sirst of May, on an open rich spot, in rows two seet apart, and eighteen or twenty inches in the row. The principal crop is to be sown about the sirst or middle of May, and planted out in July, and a later crop may be sown in the end of June, and planted out in August: Strong loam in an open situation is most eligible.

The brown, green, or purple kinds, answer best for early crops, and the white, for the principal and late.

Keep them clean of weeds, and when the plants are fairly established and begin to grow, let a little earth be drawn up to their stems, which will greatly promote their growth. Before the leaves expand so as to cover the ground, let them be finally moulded up; and this is to be observed also for caulislower, cabbage, savoys, &c.

SECTION V.

CABBAGE.

Cabbage is plentifully produced on garden land of almost any kind; but most abundantly on a strong

strong loam of eighteen to twenty-four inches in depth. The land should always be manured for this crop, as one of the leguminous kinds should follow it. If it is a light sand, &c. cow dung, hog dung, or loamy marle, is most eligible; if a strong loam, stable dung, sea weed, or shell marle, as simples; or a compound of all these, or of any of these with sheep dung, pigeon dung, vegetable mould, or any of the kinds of ashes; if a clay, stable dung, sea weed, shell marle, or sheep dung as simples, or a compound of lime, stable dung, sea weed, pigeon dung, and vegetable mould, or of shell marle, stable dung, sea weed, any of the kinds of ashes, and vegetable mould; or of any two or more of the above.

The same manures for the same soil, will equally answer for cauliflower, greens, savoys, &c.

There are many kinds of cabbage in cultivation; but those most esteemed for the garden are, the Early Dwarf, Early York, Early Sugarloaf, Late ditto, Battersea, Red, for pickling; and the large broad Dutch for cattle.

For an early crop, fow of the Dwarf, York, Early Sugarloaf, or Battersea, (but the true Early York is to be preferred) on a light open spot about the first or second week in August; and about the first of October plant them out on an early border, or other warm spot, at the distance of a foot each way, that in Spring the one row may be cut up for Greens (which are then in general request) and the other retained to come to maturity; and for a successional crop, plant of the same sowing and kinds, and also on the

fame

fame or a similar situation, about the first or middle of February, at the distance of eighteen or twenty inches each way. For crops to succeed these, sow of any of the above kinds every three or four weeks from the first of February to the first of June, on an open spot of light land; and plant, when sit, in an open and free situation, at the distance of from eighteen to twenty-four inches each way, according to the kinds, and quality of the soil.

The red kind is to be fown in August or February; and planted out in October or April, on an open spot at the distance of two feet each way.

The broad Dutch is to be fown about the first of September, and planted out in March; or in the beginning of February, and planted out in April; on a well exposed spot, at the distance of thirty inches each way.

The two last kinds, being generally left in the ground for winter and spring use, and from the length of their stalks, are frequently much injured by the severity of frost, should be laid over in an oblique direction, which both secures them from frost, and from the bad effects of blanching rains, in rotting their hearts.

SECTION VI.

CAULLIFLOUR.

This vegetable being much esteemed, there are few who are not provided with hand or bell glasses for its early production. For this crop, the plants should

should be fown on a light open spot, about the latter end of July, or first of August; and when they are fit for pricking out, should be put fingly into pots of four inches diameter, filled with rich mould, and placed in a peach or vine house that is not at work, or under a frame and lights, where let them enjoy free air, and be moderately refreshed with water; and in very severe weather defended from frost, and from blanching rains, &c. till the middle of February or first of March, and then plant them out on an early and well enriched spot, placing two under each hand, and one under each bell glass. If, however, you have a sufficiency of plants, it may be advisable to place one more in each, than is required to remain for good; as early caulliflower frequently start or button about the first of April, and if one or more of them does not, it is but the trouble of pulling them out again.

For a crop to succeed these, plants of the same sowing, and which have been treated in all respects as above, may be planted in a like situation and soil, in the open air, about the first or middle of March, at two seet apart each way. For a third successional crop, sow as hinted in the note, page 8, or on a slight hot-bed about the first of January, and when sit, plant them out in an open rich spot of loamy land. Sow again about the middle of March, and when sit, plant as above. And lastly, sow about the eighteenth or twentieth of May, and also plant as above, or on a wall border, which hath an east or west aspect. In the summer months, water frequently in dry weather. Do not plant too deep, otherwise the hearts of the plants

plants will not only be liable to damp, but become an easy prey to slugs, &c.

The last crop will come in about the first of October, and if a sufficiency was planted, will last till the frost destroys it. It is common to preserve these in cellars or other out-houses, or in back-sheds of hothouses, &c. by taking them up roots and all, and laying them in sand, &c. or by placing them in vine-houses, peach-houses, hot-bed frames, &c. &c. in all which methods care should be taken to keep them as dry as possible, and to divest them of any leaves which decay.

The soil which produces this vegetable best is a loam neither light nor stiff, of at least eighteen inches in depth, and which is well enriched with any of the common manures usually applied to such soils.

SECTION VIL

CARROT.

This, above all other vegetables, delights in next land, and that which produces it best is a light sandy loam of eighteen or twenty inches at least. Carrots should never be sown with manure of any kind. The best erop I ever saw, was produced on a spot of ground (a sandy loam and very poor,) which was trenched three spit deep, and which a spade or plough had never previously penetrated into, above nine inches.

For an early crop, fow of the early horn or orange kinds, on a slight hot-bed, about the middle of January; or on a light early border under hand glasses, &c.

about the first of February. Let them be frequently refreshed with water, exposed to the air in fresh weather, and kept clean of weeds; also thin them out to about three inches square.

The principal crop is to be fown about the first or middle of April, in an open exposure, in drills two inches deep, and at the distance of twelve or fourteen apart. The long red or orange kinds are fittest.

The chief property of this vegetable is the length and cleanness of the root; and for the attainment of perfection in this respect, the land should be trenched or sub-trenched to the depth of eighteen inches at least, and well broke in the operation. Before drilling, the surface should be lightly rolled, or evenly trodden with the foot, otherwise the seed is apt to be unequally buried.

When the plants have arrived at the height of two or three inches, thin them out to the distance of five or fix apart; but this operation should not be performed in very dry weather, or when the ground is in a dry flate, especially if the plants have risen thick, as thereby the remaining ones will be much hurt, those which are pulled out, both loosening and leaving the ground about them full of holes to the depth of their extremities. The ground should be immediately hand-hoed, whether it be foul or clean of weeds, and that with the view of clofing the holes about the remaining plants. For want of the above precaution, are many crops of carrots much injured. Keep them clean of weeds at all times, and pull out fuch as run to feed, these being both useless, and greatly exhausting the ground.

Such

Such part as are to be preserved for winter or spring use, should be built in walls of about thirty or thirty-fix inches thick, with dry clean sand. If thicker, they are apt to heat. They should also be taken up when the ground is in a dry state if possible; but if this is not the case, they should (previous to building) be laid thin in the barn, shed, &c. for eight or ten days. The situation where they are to be stored, should be cool, dry, well aired, and capable of being defended from frost.

SECTION VIII.

CELLERY.

This vegetable is in great request in most families; and in many, as long a succession of it as can be produced is required. For the first crop, sow about the first of January, either as hinted in page 8, or on a hot bed; for a second, by the first of February as above, or on an early border having a south aspect, and cover either with a frame and lights, or hand-glasses, &c. for a third, by the first of March, also on an early border; and for a fourth and last, about the first of April on an open spot. In all which cases, light rich mould is to be chosen. I have always found vegetable mould of infinite advantage for the early crops.

The manner of planting, situation, and soil, for all the crops should be the same, and the following is most approved: The plants in all cases are to be pricked out into nursery beds, which strengthens

them

them much, and makes them put forth fine young fibres; and when they are fit for planting they are to be planted in rows, twenty inches asunder, and eight inches in the row, across trenches of eight feet wide, having spaces of four feet between them, whereon to lay the mould that is dug out of them, which is to be done to the depth of six inches only, this, together with the depth of the soil of said spaces being sufficient for moulding up with. This is to be understood, however, of land that is at least two feet deep, and which lies dry; as, on the contrary, the plants are to be planted on the surface, and the spaces between, are to be a foot or two more, to afford a sufficiency of soil for blanching with.

The foil best adapted to the production of Cellery, is a rich loam of a middling texture; and the sittest manure is a composition of stable dung, and vegetable earth; but stable dung alone, which is pretty well reduced, will do very well. Light sandy loam well enriched with cow dung, will also produce Cellery

in abundance.*

In moulding up, a dry day is always to be chosen, and too much is never to be applied at a time, lest the hearts of the plants be covered, in which case they are sure to rot, if damp weather ensue. Cellery may be successfully preserved for many months in fand, &c. in the same manner as carrots.

SECT.

^{*} It is faid cellery grows well, and arrives to a good fize in peat-earth.

SECTION IX.

CARDOONS

Are in request in many families. They are most fuccessfully produced on a deep fandy loam, not too rich.

Prepare fingle trenches, in manner as is practifed by many for cellery, at the distance of four or five feet from centre to centre, and just as deep and wide as a fingle spit will make them, laying the mould in the interspaces. Point in a little compost manure in the bottom; draw a drill an inch deep in the centre of the trench, and drop the seeds at two inches apart. The season is, from the middle of May to the middle of June.

When the plants are two or three inches in height, thin them out to about nine or ten apart. Mould up in all respects as for cellery, with this difference only, that the leaves must be gathered, and tied together each time with a bit of old matting, otherwise the mould would get between them in the process of blanching.

Cardoons may also be preserved in winter, in the same manner as carrots, cellery, &c.

SECTION X.

FRENCH BEANS

Are most successfully produced in a rich, light, dry loam, and are most prolific without manure.

For

For an early crop, fow in a hot-house or hot-bed, of the speckled dwarf, about the first of April, and plant them out, when sit, at the bottom of a wall or other sence, having a south aspect. For a second crop, sow in drills two seet apart, of the speckled Dwarf, Battersea, Negro, Liver-Colour, &c. on an early border, or other warm spot about the middle of April or sirst of May; for a third crop, of the same kinds, on an open exposure about the middle of June; and for a south and last, of the Scarlet or White Runners, on a like situation, in drills three seet apart, about the sirst or middle of July. These must have sticks to run on, and will generally produce till frost destroys them.

Keep them clean of weeds, and let them be earthed up, first, when the plants are about three inches high, and finally, when about nine or ten.

SECTION XI.

GREENS.

That is, Savoys, Kail, German-greens, &c. are cultivated in all respects much in manner of cat-bage; and are generally planted in an open and well exposed situation. The times of sowing are February, March, May, June and August; and of planting, March, May, July, August and September. But where a constant succession is required, they may be planted every three or sour weeks from February to September. The distance is from twelve to twenty-sour inches each way, according to the strength

strength of the land, season of the year, size and age they are to be suffered to grow to.

SECTION XII.

LEEKS.

This is a hardy vegetable, and does well on most kinds of garden land, but is produced in greatest abundance on a strong loam. The ground should always be manured for this crop, especially if for spring use, as, in that case, they exhaust the ground much. It may be any of the kinds most properly applicable to the soil.

The feed is to be fown on a bed of light rich loam, at any time, from the first of February to the first of April. The true Scotch Leek is to be preferred. The season of planting is, from the first of June to the first of August; and they are to be planted in rows twelve or sourteen inches asunder, and sive or six in the row. The most approved method is to make deep holes with the setting-stick, thrust the plant to the bottom, and let the hole remain open. This is done with the view of saving time in drilling, as it is found the plants strike root as fast this way as if the earth were closed about them; and thereby afford an opportunity of blanching equally well.

Keep clean of weeds, and top the leaves three or four different times in the course of the season, which makes them put forth new heart leaves, and consequently swell the stalk to a much greater size than they otherwise would.

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SECT.

SECTION XIII.

ONIONS.

This is a valuable vegetable, as almost all are fond of it. It requires a strong rich loam to produce it in persection; but in wet seasons we fre-

quently see good crops raised in light land.

In all cases, the land should be well enriched with manure, which, however, should not be applied at the time of sowing; the best method being either to fallow or take a light crop immediately before, at which time the manure should be applied; which may be any of the kinds best adapted to the nature of the soil. If this is not the case, and manure is to be applied at the time of sowing, compost is to be preferred to simples.

A fixed feafon for fowing can hardly be determined, as in all cases we frequently see the crop blasted in Summer, either with two much wet or drought, in which latter case, it is sure to be destroyed by maggots. Amongst the best crops I ever saw, were sown about the middle of January. The middle of February or first of March however, seems to be a more eligible time, as the weather is then generally more favourable for sowing small seeds. I have also both raised, and frequently seen, excellent crops of Onions that were sown about the first of August; in which case, about the first of May following, their hearts are all to be picked out to prevent them from running to seed. This, in fact, seems to be the surest

way

way of obtaining a crop on light land; but in wet land it is not adviseable.

Onions should be sown either on sour-foot beds, or in drills a foot asunder, and should be thinned out to five or six inches square in the one case, and three apart in the row in the other. The kind best adapted to this climate is the Strasburgh, for although the Portugal, &c. will grow freely enough, it seldom risense well and applicable descent because the

pens well, and confequently does not keep.

Onions may be successfully transplanted; and when it happens that there are blanks in the beds or drills, should be practised, that there may be an equal crop on the ground. In all cases let the ground be kept clear of weeds; and about three or four weeks before the crop is sit for pulling, let their stems be all broke down, or in other words, laid. This is most speedily performed by two people taking each the end of a rod, and walking slowly up the alleys or rows, holding the rod at such a distance from the ground as to generally strike the plants at the height of four inches above the bulb. This is of great use, particularly in wet or late seasons, as thereby the growth is diverted from the leaves, and the bulb swells safter in copq uence.

SECTION XIV.

PARSNIP.

The cultivation of this root is so nearly similar to that of carrot, that it would only be wasting time in saying more of it than that the season of sowing is from the first of March to the first of May; and that, as the leaves grow more gross than those of carrot, they are to be allowed an inch or two more between the plants in the row. Beet, Salsafy, Skirret and Scorzonera, are also cultivated in the same manner in all respects.

SECTION XV.

PEAS.

These are in general request from the month of: June till November, if the weather will permit. The most successful way of producing the early ones is this: Of the true early frame (or Charlton, if these are not to be had) fow a quantity in boxes or large pots, &c. about the first of November, and place them either in a peach house or hot bed frame, &c. where they may enjoy plenty air and light, and grow flowly; keep them here till the middle of February or first of March, and then place them out of doors in a warm and free fituation; let them be covered with mats at night, and even in the day at first, if the weather prove stormy, observing to harden them by degrees; and when the weather is mild enough, let the mats remain off at night occasionally; continue this treatment till the first of April, and then draw drills of three inches deep, on a warm light border in a fouth aspect, in which plant them an inch apart, observing to take them carefully out of the boxes, &c. that none of them be bruited.

For a fuccessional crop, sow of the same kind, and on the same border, (or a similar,) about the first of January; January; charltons, and also dwarf marrows, on an open spot about the first of March; dwarf, or tall marrows, or any of the other kinds, as soon as the last appear above ground, which repeat till the first or middle of June; but the last sowing or two, should be of charlton or framing, as these answer best for both early and late crops.

Peas do well on almost any garden ground, but they are most prolific in strong soils. The ground is seldom manured for them, as they generally sollow some crop that required manuring or fallowing.

The best method is to sow in double drills of ten inches apart, if they are to be sticked; as one row of sticks placed in the middle will generally serve both. The distance in this case is, from sour to sive feet between the centre of the double lines, according to the kinds. For single rows, a foot less respectively,

Keep clean of weeds, and earth up, first, when the plants are about two inches high; secondly, when about eight or ten; and lastly, when they begin to flower.

SECTION XVI.

POTATOES

Are an abundant crop on most kinds of garden land, but they are cleanest on light loams. In gardening, the ground is sometimes manured for this crop, and sometimes not; if so, a moderate dunging with any of the kinds best adapted to the soil will generally answer. The object is generally a few early ones,

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ones, except sometimes for the sake of changing crops. For this purpose, plant of any of the early kinds on a warm border or other sheltered spot, in rows eighteen or twenty inches asunder, and six in row, about the first of March. Sooner is attended with bad consequences: the seed will seldom begin to vegetate before that time if planted ever so soon, and if hard frost or much wet ensue, it will be much injured.

For a principal crop, plant on a free and open exposure, in rows from twenty to thirty six inches as a funder, and from six to twelve in row, according to the kinds and quality of the soil, any time from the middle of March to the first of May.

Keep clean of weeds, and when the plants have arrived at the height of three inches, let a little earth be drawn to their stems, and when to nine or ten, moulded up for good. Any weeds that appear afterwards are to be pulled with the hand. The hoe must not be used after their roots begin to run.

Much has been faid respecting cutting of potatoes for seed, some recommending planting them whole, and others cutting them into single-eyed sets; some cutting them two or three weeks before planting, and others planting as they are cut. My method is this: cut the large ones into sour, the middle sized into two; and the small, plant whole; plant within forty-eight hours of cutting, and not sooner than twenty-four: whereby the sets are of a moderate size and strength, nor is there any waste; are sufficiently dried to resist corruption, and not too much to prevent instant vegetation.

The method of planting the shoots is justly exploded. I have, for one, given it fair and frequent trials, and am convinced it is of no utility.

The curl is a disease which has given the cultivators of this plant much trouble, nor has there, as yet, been any effectual remedy discovered.

It would feem to be occasioned, either, ist, by an insect lodged in the eye of the set, since frequently we find clean and insected stems issuing from the same root, and which continue distinctly so throughout. 2dly, By being planted in too heavy or wet land. 3dly, By being planted in too poor and hungry land. 4th, By the same land having been too frequently and too recently cropped with potatoes. And lastly, as is the most general opinion, for want of changing the seed.

At any rate, it is a malady, which every one ought to endeavour to remedy. What follows are given as hints with that intent, and which, as is hoped, the candid will apply, or improve, as they may feem to merit.

In respect of the first opinion, whether it be really an insect, or whether it be not rather in consequence of the set being, by some unknown cause, diseased, merits investigation. That it is an insect, I cannot bring myself to think. But that it may proceed from disease in the set or root, seems to carry reason along with it. What might occasion this disease, may either proceed from the seed being injured by frost, damp, mould, or being over dried. And it is well understood, that, from no diseased seed, shoots or spawn, need we ever expect to raise plants as healthy, or that shall

shall ever become so, as from clean, fresh, and well matured seed, &c.

In respect of the second and third opinions, as in fact they embrace the same thing, since they imply, that neither of the situations are congenial to the nature and inclination of the plant in question, I have just to say, that if a plant shall be stinted in growth, from any cause whatever, disease will inevitably sollow. On annuals of a quick growth, such as the plant in question, this is sooner perceptible than on others.

In respect of the fourth opinion, which certainly carries with it a strong presumption of the case, if we admit that there is propriety in changing crops, and that all culinary plants, which are not natives, degenerate less or more, if continued in the same soil successively, we may reasonably suppose it probably proceeds hence. And yet it hath been proved, in some instances, that this is not the case, by potatoes being continued for many successive seasons on the same spot, without any appearance of the curl, although they degenerated in size and shape.

In respect of the last and most prevalent opinion, viz. for want of changing the seed, by which is to be understood, from one farm, &c. to another, or from one country or district to another, much might be said on both sides of the question. But I must beg to say, that it by no means carries conviction to me, that this is the cause, or indeed, that it can possibly operate in the smallest degree towards it. On the contrary, the curl has frequently been brought to places where it was never known before, by this mistaken notion.

And

And this may not be wondered at, if we admit that, the disease remains in the root, and is contagious.

But, may not the feed be as effectually changed on the fame farm, or garden, if of any confiderable extent, as by being carried from one parish or county to another? Are potatoes improvable, like wine, by being fea borne, or land-borne, without being afterwards planted in foil, different from that in which they last grew? Certainly, no. And shall he who has his feed brought from land, non-descript, and which he never saw, be certain of planting again in that which is effentially different in quality? May it not as probably happen, that, per chance, he shall plant in land exactly similar to that in which his feed was produced?

I therefore hold, that he who shall be at all due pains in saving wholesome seed, by divesting the crop intended for this purpose, of all insected plants, so soon as they appear; secures it from frost, damp, or much drought, till planted; plants no weak, or insignificant sets; plants on fresh, well broke, moderately enriched land, of a midling texture, rather light than otherwise; allows a sufficiency of room; and keeps clear of weeds; bids fair for overcoming the anxiety attendant on this malady.

SECTION XVII.

SHALLOTS

Are a precarious crop, being equally subject to injury by too much drought or wet. A rich dry loam and

and free exposure is most eligible. A fixed season of planting can hardly be determined, and it is most adviseable to perform this operation at different times, viz. November, January, and February.

Plant either in four feet beds at eight inches square, or in rows a foot apart, and sour inches in the row.

Keep clean of weeds, and whenever any of the plants begin to canker and become maggoty, pull them up; as otherwise the whole will be quickly affected.

SECTION XVIII.

SPINAGE.

For the summer crops, all soils will answer; but for the winter, light loam and a dry situation are sittest. Manure is seldom applied, except for the sake of what is to follow.

For the Spring and Summer crops, fow of the round feeded kind, thinly, in drills a foot apart, from the first of February to the first of August, at intervals of ten days each; and for the winter, of the prickly kind, any time from the middle of July to the middle of August, also in drills as above. Being of a quick growth, weeding or hoeing is seldom necessary for the summer crops. For the winter, once or twice will generally be sufficient.

SECTION XIX.

SEA CALE.

This vegetable is most fuccessfully produced in light rich sand, of sisteen or eighteen inches. It will do pretty well, however, on all lightish loams. In stiff soils it makes little progress, and is also apt to perish in winter.

The manner of culture is simple; and it may either be raised from seed, or offsets from the root, which come up in abundance in spring, and are the eatable part of this vegetable. The most eligible method is to sow or plant (in March or April) in rows, a yard asunder; and the plants are to stand, for good, at the distance of ten or twelve inches in the row.

Keep clean of weeds at all times, and in autumn or fpring let a little compost manure, or well rotten dung, be slightly pointed in, so as not to injure the roots; at same time shedding a little mould on the rows.

SECTION XX.

TURNIPS.

The lightest soil in the garden is generally best adapted to their culture, and it should also be well enriched. If it is to be manured for the turnip crop, compost is preferable to simples. In either case, all the kinds of ashes, soot, and pigeon-dung, is to be avoided.

The first of March is soon enough to sow, as I have feldom

feldom feen plants fown fooner come to any good; they are fure to run to feed and canker. A few may be fown on an early border, but these are not much to be depended on; an open situation being the best at all times of the season.

For producing a constant succession, make it a rule to sow as soon as the last appears above ground; and repeat this till the first of August. The early white Dutch is generally sown for the Summer crops, and the yellow for Winter, for table and market use, in which case they are generally sown broad cast, and thinned out to from nine to twelve inches apart.

The fly is often very troublesome, but as they only prey for a few days; on the infant plants, the most effectual way to secure a crop is to sow thick, thereby satiating them. Nevertheless, they frequently destroy them in patches, and some in that case, sow again on the same spot; but this is seldom attended with success, as they are either destroyed again by the fly, or do not keep pace with the other part of the crop, so as to make it an object of trouble.

Before concluding this chapter, I would observe, that all seeds and plants should be committed to the ground as turned over, or as soon after as conveniency will permit. It is then in the most active state, and vegetation instantly commences. Neither should ground ever be digged in a very wet state, except, perhaps, in fallowing.

CHAP.

CHAPTER V.

CULTURE OF SALLADS AND HERBE.

SECTION I.

SALLADS.

Chervil, Crefs, and Muftard.

HESE articles are raised much in the same manner; and where there is the conveniency of a hot bed frame, or hot-house of any description, with the addition of a sew boxes, tubs, or large pots, may be had every day in the year, in abundance, by the trouble of sowing once a week, or ten days, as occasion shall require.—To say more of them would be trisling with time.

Endive.

Although I have ranked this vegetable as a fallad, it is also frequently used in the kitchen; and by many is much in demand.

It succeeds best on a light, dry, loam. On wet land, it seldom fails to rot in autumn. Neither should the ground be manured for this crop.

For the first crop, sow of any of the kinds, in a light open spot, about the first of June, and plant about the first or middle of July, in rows from sisteen to eighteen inches apart, and nine in the row, in an open exposure. For a sull crop, sow also of any of the kinds as above, about the middle of July, and also plant as above, about the middle or latter end of August.

Keep the plants clean of weeds, and let them be earthed up at two or three different times, in order to blanch the leaves. This is also effected by tying them up, but in wet seasons they are apt to rot. Endive may be successfully preserved in winter, by being laid in dry sand, in the cellar, shed, or under a frame and lights, &c.

Indian Grefs

Is often used in sallads, and makes a beautiful garnish. The flowers are the useful part for this purpose, and the seeds make a fine pickle. Any soil will answer, and the most eligible situation is against a dead sence, or unsightly wall, which it will rapidly cover and beautify.

The feason for sowing, is any time from the middle of February to the first of June, in drills an inch deep, and in manner of peas, &c.

Lettuce,

Lettuce,

Is successfully cultivated on all soils, in all situations, and almost at all seasons. The times of sowing are from January to October, at intervals of, from one to sour weeks, according to the season and demand; and of planting, from the first of February, to the first of November, at intervals also as above.

The kinds are numerous; and those most to be preferred, are the true green coss, hardy green, and brown Dutch, for standing the winter. These are to be planted in October, or beginning of November, at the bottom of a wall or other sence having a south aspect and dry bottom; or under a frame and lights, hand glasses, border in the peach or vine house, &c. &c. in which case they are to be duly refreshed with water, have air freely admitted to them in fresh weather, and defended from severe frosts, or blanching rains.

Parfley,

Is both used as a sallad, and in the kitchen, and is in constant demand. Some force it in hot-beds, &c. but a winter store is better secured by covering with a frame and lights, or hand-glasses, part of the preceding summer crop; which, for this purpose, should be sown about the first of June. Other crops are to be sown in beds, or rows round the quarters, walks, &c. from the first of February to this time, as circumstances shall direct, and of the kinds most in demand.

Purstane,

May also be raised in all respects, in manner of chervil, cress, &c. Being of a succulent nature, it likes a dry sand the best. It does not stand frost well, and therefore should not be sown out of doors, sooner than the first of March.

Radish,

Is plentifully produced on all foils, and is fown from January to September, with equal success, at intervals of, from one to three weeks. The short-top and salmond, are most proper for early spring; the white and red turnip, for summer; and the black Spanish for winter use; but all the three last will stand the winter in general, and for this purpose should be sown on light soil, about the first of September.

In the latter end of spring, the shot-top, and salmond kinds frequently get sticky, and run for seed sooner than successional crops can be got forward, in sultry weather. To remedy this inconveniency in great measure, it may be gratifying to the admirers of this sallad to know, that by closely pinching off the tops, drawing them upwards half an inch, so that the tap-sibres be just broke, and letting them remain till wanted, they will keep fresh and good above a week afterwards, until the successional crops come forward.

SECTION II.

POT HERBS.

Bafil.

This is a tender exotic, and requires artificial heat to forward it in fpring. About the first of March, sow, either on a gentle dung heat, in a vine or peach-house, or, as hinted in page 8, in rich, light mould; and transplant, when sit, on a well exposed, rich, light spot of ground, in rows a foot asunder, and three inches in the row.

Such part as is to be kept for winter use, is to be cut over, so soon as in full flower, and gradually dried in an open shed, &c.

Fennel.

May either be raised from seed, or propagated by slips of the root. It will grow freely, in any soil that is not very stiff.—A few plants of it will serve a large family.

Marigold,

Is to be fown in the spring months, in two or three successions, from the middle of February, to the first of May. The flowers only are useful.

Marjoram, Savory and Thyme.

The same culture answers all. Sow in beds of light earth, in a free situation, about the middle of P 2 March

March, or first of April. If the knotted marjoram, or sweet savory are wanted early, a little may be raised in manner of the basil as above. Green thyme, pot marjoram, and winter savory, may be kept fresh all winter, if required, by being sheltered with hand-glasses, a frame and lights, &c. but when properly dried, they have the same effect in soup, broth, &c. and this is seldom practised. These last are most generally propagated by slips.

Mint.

That is, sweet, or spear-mint, is propagated most speedily by slips of the root. The season is March or April. It may either be planted in rows, nine or ten inches asunder, or on four soot beds. Rich light loam will produce it in highest perfection.

If it is wanted early, a little forced on a flight dung-heat, in manner of asparagus, either under a frame and lights, or hand-glasses, will generally serve till it comes in the natural ground.

Sage.

This plant is propagated, either by slips of the root, or by cuttings with facility. For the former method, March, or September is the season. For the latter, any time from May, to August. Sage thrives, and also stands the winter best in lightish, sandy loam, and a free-exposure. Its leaves, for winter use, are to be cut when full in slower, and gradually dried in a shed, &c.

Sorrel,

Sorrel

Will grow almost any where, nor is it easily eradicated from the soil afterwards. Slips planted in March, or indeed any time, will not fail to grow vigorously.

Tarragon.

What has been faid above will apply here, except that tarragon will fometimes, if in a wet fituation, perish in winter.

GHAP.

CHAPTER VI.

ON THE ROTATION OF CROPS.

A S in agriculture, so in gardening, a proper rotation of crops is of great importance, and the reasonable and useful practice of cropping a part of their ground every season, with some of the species of grain or grasses, is becoming prevalent among market gardeners; which, besides being useful for their cattle, is found of infinite advantage to their ground.

This matter, however, can by no means be so effectually accomplished in the garden as in the farm, for these reasons: it is smaller, and the articles to be cultivated are much more numerous, and also more akin to one another.

The different articles, however, might with propriety be classed in this case, as, Brocoli, Cabbage, Caulislower, and Savoys; Beans, French-beans, and Peas; Carrot, Beet, Parsnip, and Turnip; Leeks, Onions, Shallots, &c. Cellery, Endive, and Lettuce, &c. &c.

Cellery is an excellent preparative for asparagus, onions, or cauliflower; turnip, or potatoes, for cabbage

bage or greens; brocoli or cabbage, for beans or peas; cauliflower, for onions, leeks, or turnip; alparagus land that has lain long, for carrot or potatoes; (currant, goofberry, raspberry, and strawberry land, may answer the same purpose); turnip, for cellery or endive; peas, &c. for clover, as a restorative, with which barley or oats might be sown.

In this latter case, however, the two preceding crops should not be manured, as otherwise, at least in most instances, the barley, &c. would be apt to grow rank, to the detriment of the clover.

After the land has lain one or two seasons thus, it will again be fit for the reception of an esculent crop, of any kind, as carrot, asparagus, potatoes, &c.

Clover, with barley or oats, may also very properly be laid down as a restorative for land of any kind, which hath been long under esculent crops without a proper change, and is consequently soul and cankering.

If it is suffered to lie two seasons, the land will again be prepared for culinary vegetables of any kind.

As a change for land as above, and which cannot be spared from esculent crops above one season, a crop of barley, oats, rye, or wheat, as a cleanser, may be advantageously taken; which will, in great measure refresh, restore, and again render it sit for the produce of wholesome kitchen vegetables.

In all cases, a studied rotation is to be advised, and such an one as that no crop of the same class may immediately follow another. For the more effectual accomplishment of which, the garden should be regularly divided into quarters, numbered, and a journal

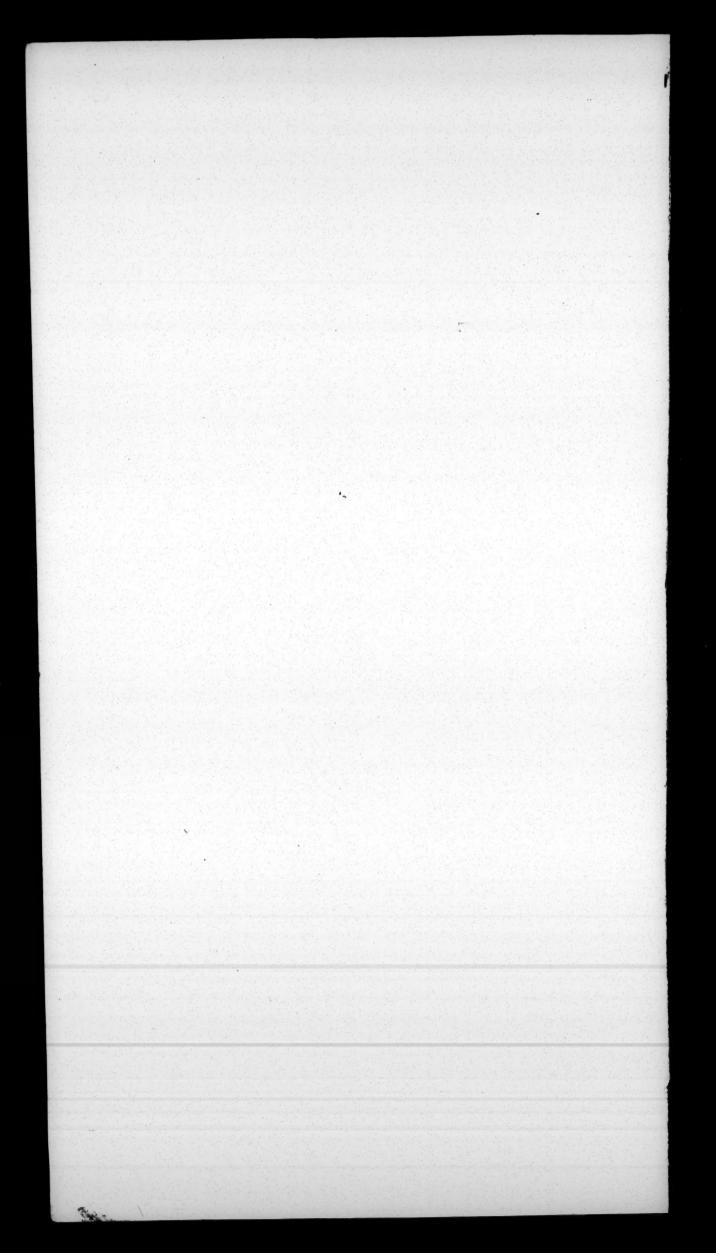
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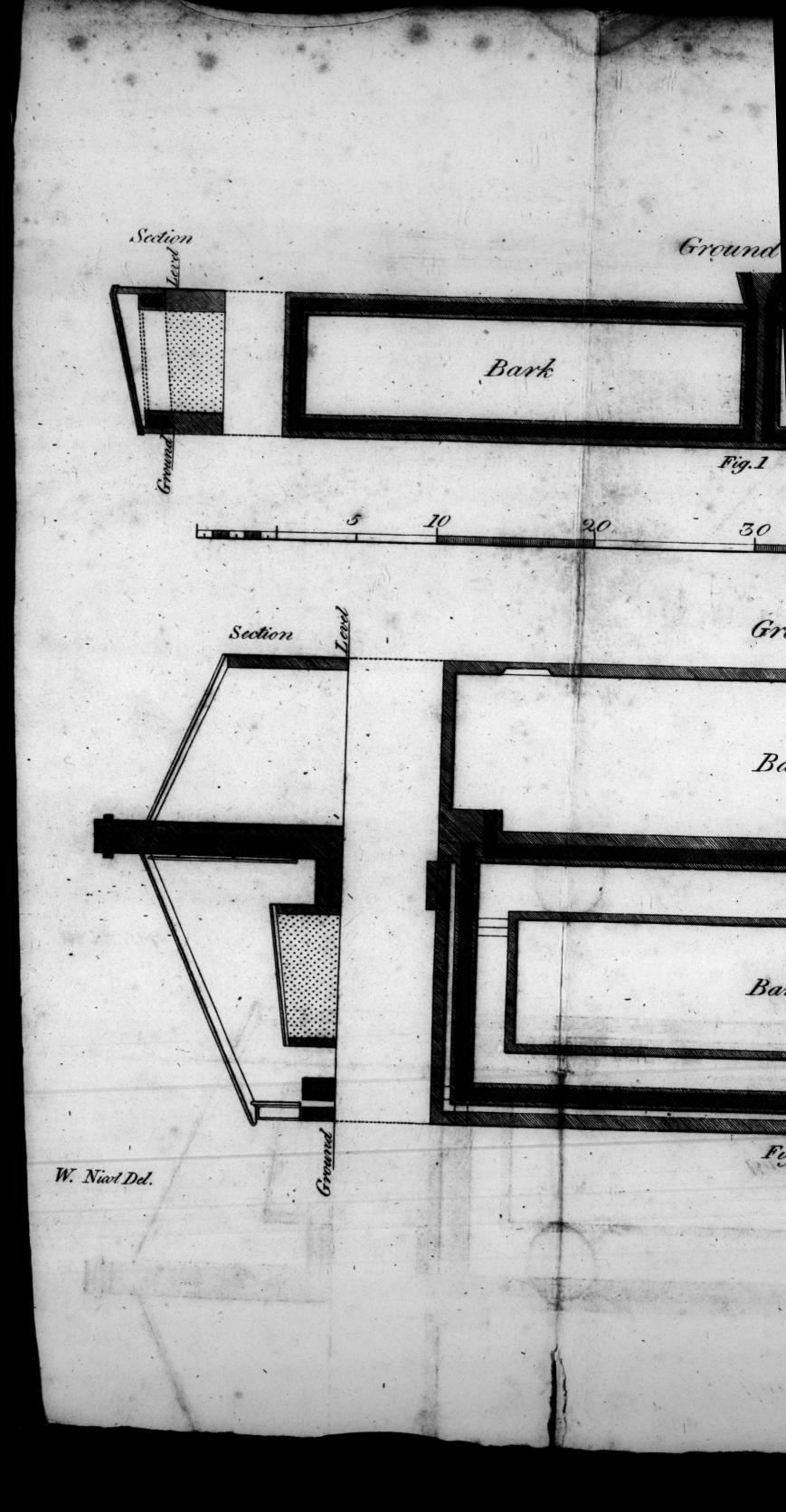
kept, wherein is recorded what respects the cropping, manuring, trenching or fallowing of each of them.—
Thus:—

No. 1. (1793.) Subtrenched after asparagus, for carrot, without manure. Winter fallowed. (1794.) Early cauliflower, with a moderate dunging, 2d Mar. Yellow turnip, with a compost dressing, 20th July. (1795). Onions, without manure, 8th Feb. cabbage, with a light dunging, 5th Oct. (1796.) Charleton peas, for a late crop, without manure, 10th June; trenched three spit deep, in Dec. winter fallowed. (1797.) Potatoes, with a moderate dunging, 20th March. German greens, without manure, 10th Sept.; intended for leeks next June.

FINIS.







Beds

9.1

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60 Feet

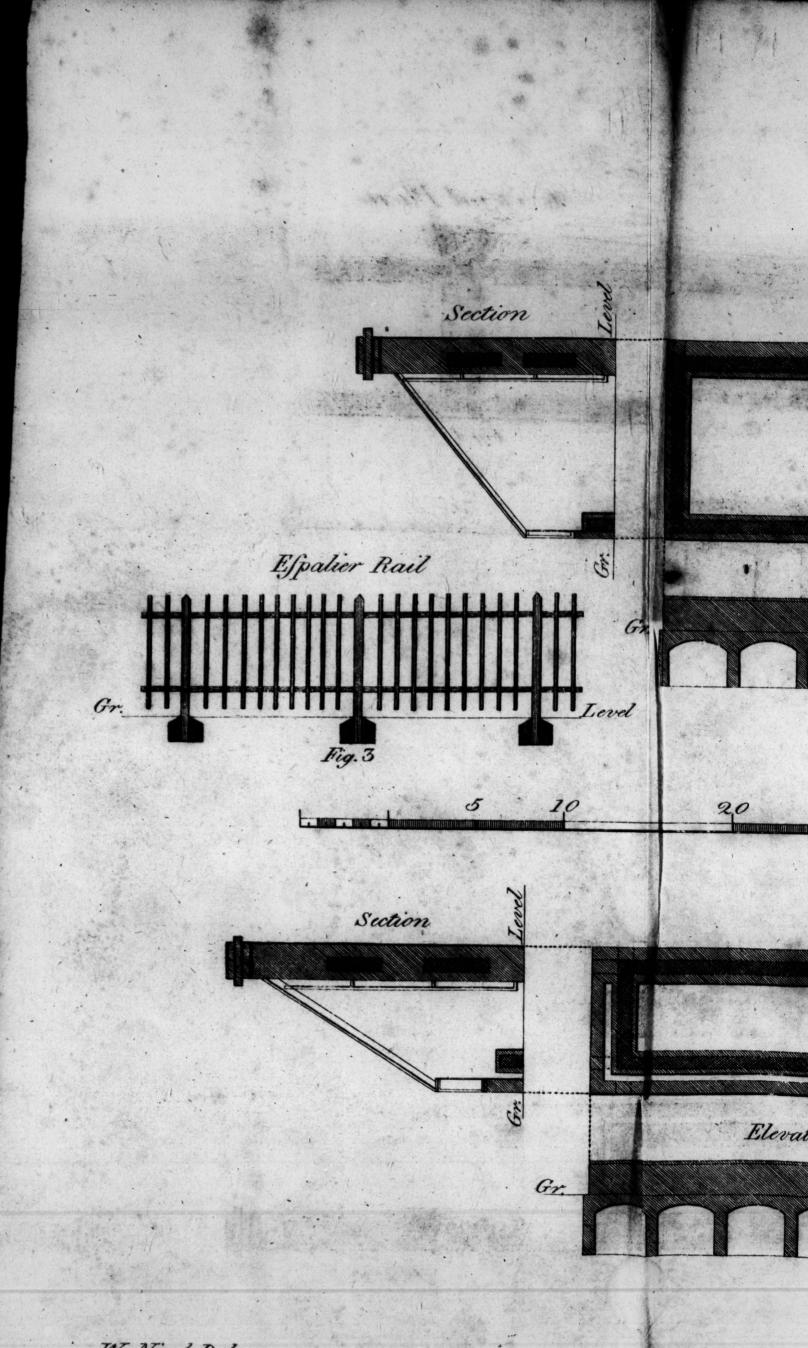
Ground Plan

Back Shed

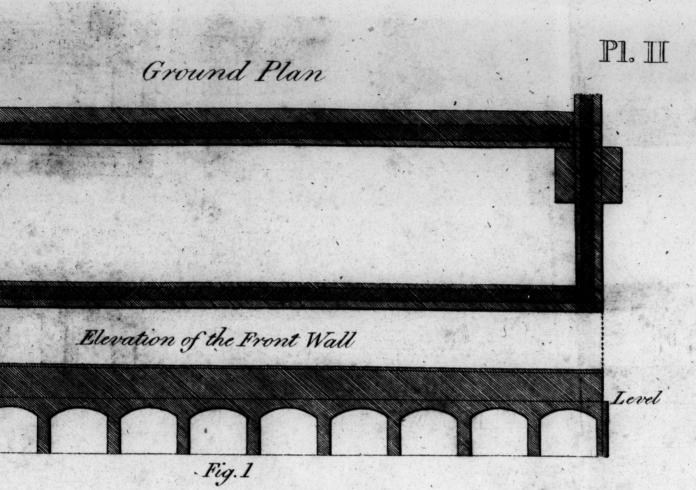
Bark Bed

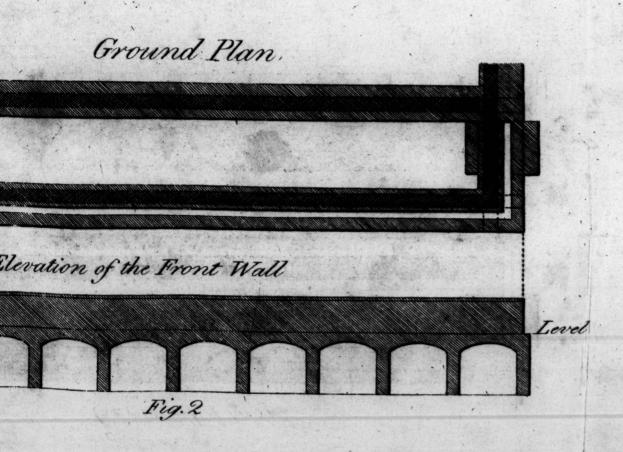
Fig 2

J. Johnson Sc.



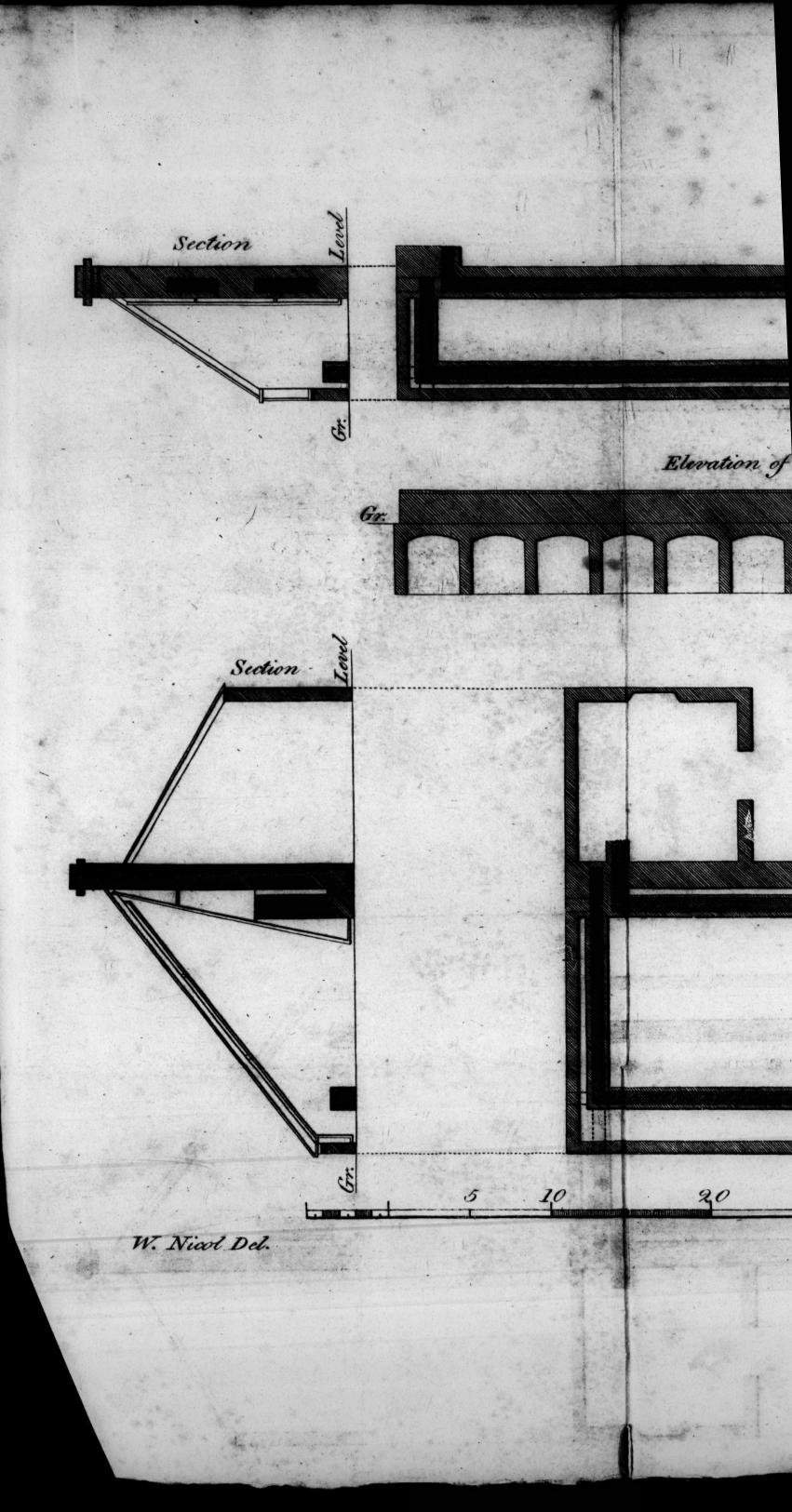
W. Nicol Del:





J. Johnson Sc.

50 Feet

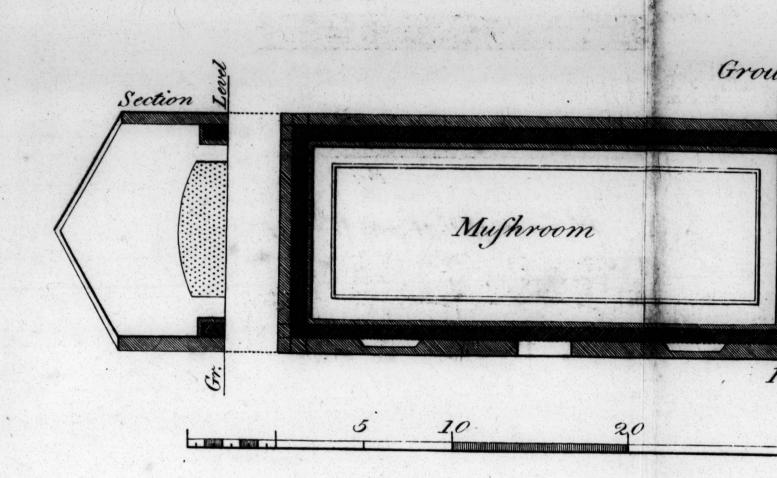


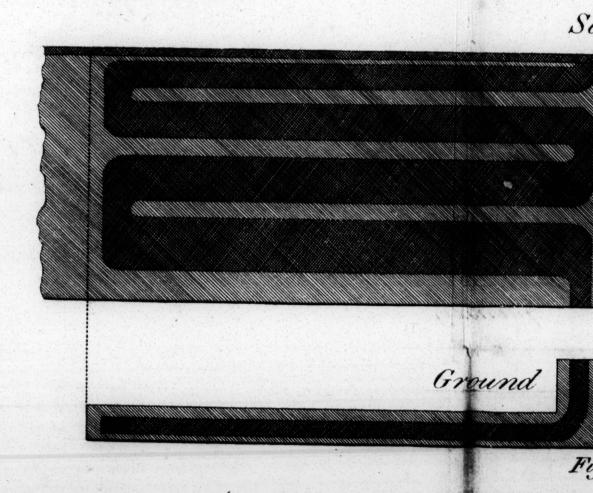
P1.III Ground Plan Fig. 2 n of the Front Wall of both Fig.3 Ground Plan Fig.1

60 Feet

J. Johnson Sc.

30





W. Nicol Del.

Fround Plan



Fig. 2

Section

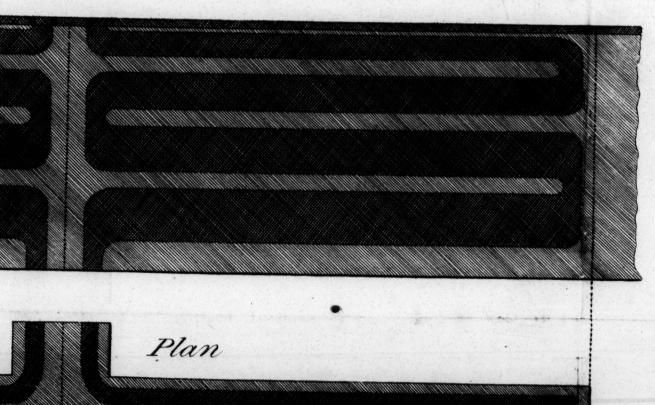


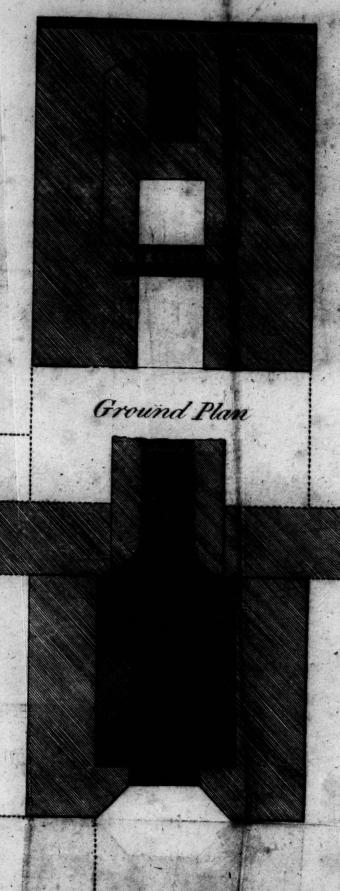
Fig. 1

J. Johnson Sc.

Section Ground Plan Fig 2 30 Horiz Winter Pruning W. Nicol Del.

Pl.V.

Vertical Section



50 Feet

Fig. 1

torizontal Section

J. Johnson Se.